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AIRCRAFT JOURNAL

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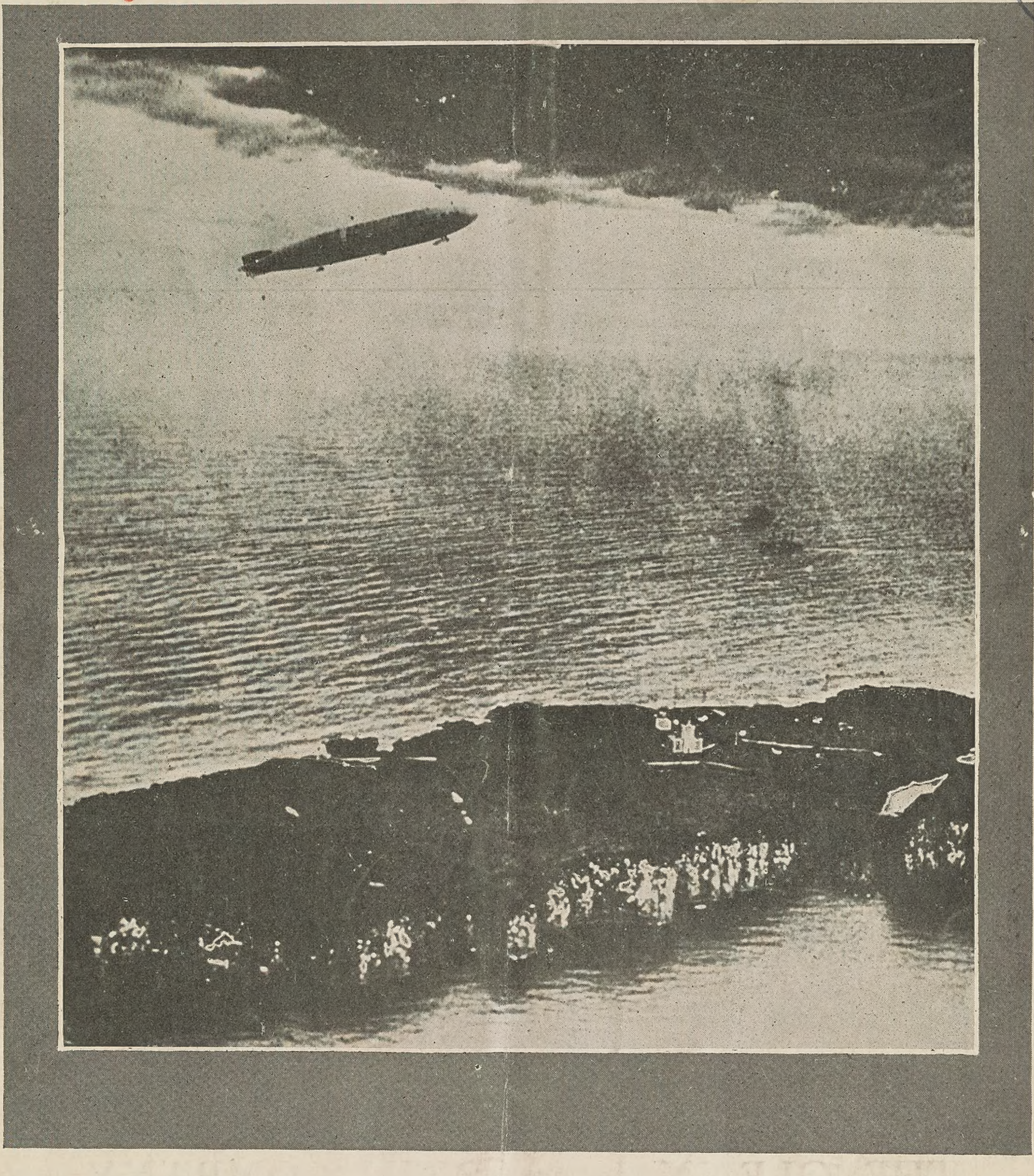
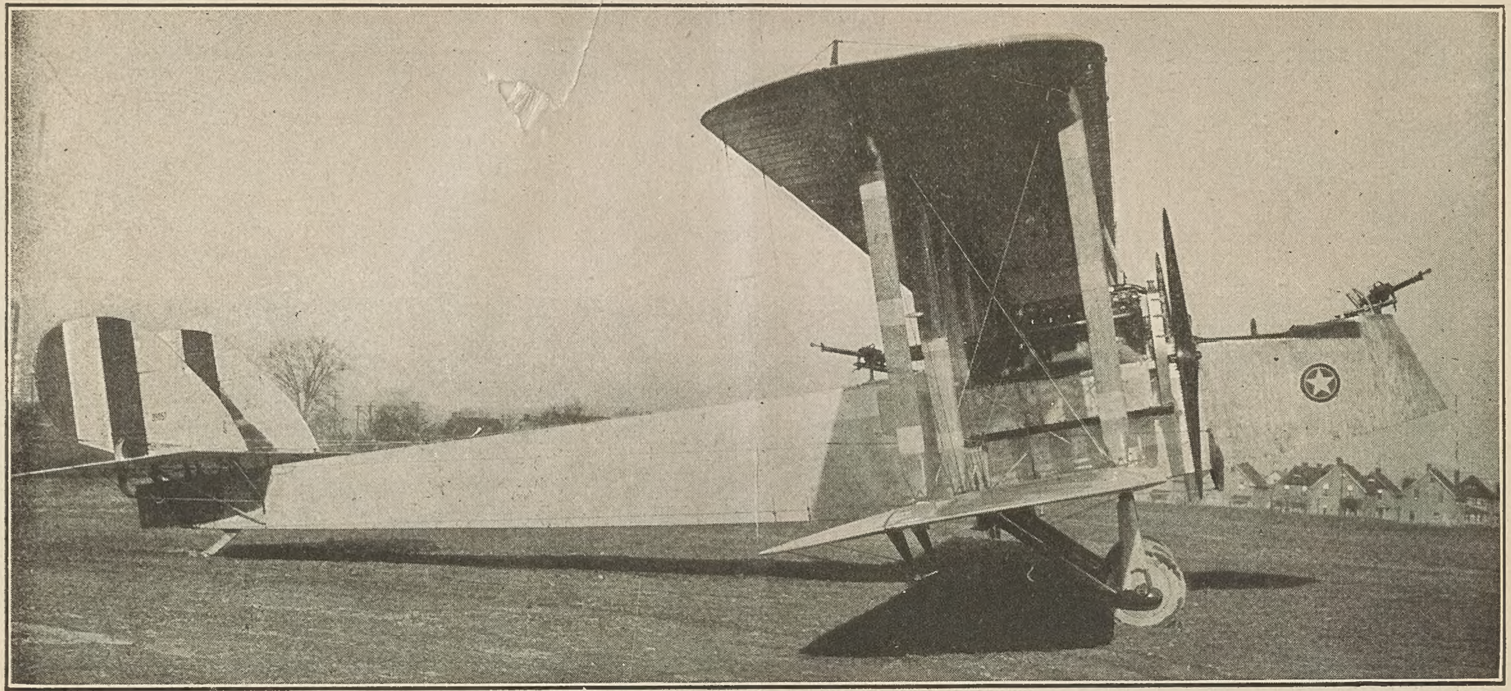


Photo Keystone View Co.

R-34 in a Test Flight as Photographed from an English Airplane 3,000 Feet in the Air



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NC Fliers Warmly Greeted at Home

All Report to Washington and Return for the American Flying Club Dinner

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Plodding slowly up the harbor under a lowering sky, which spat frequent dashes of rain, with a fleet of small craft on her flanks and astern, and flying boats buzzing ahead, behind and over her, the transport Zeppelin brought home Friday afternoon, June 27, the crews of the Navy's NC planes, six of whom were the first men in history to cross the Atlantic by the air route.

The rain dampened but could not quench the enthusiasm which had been stored up for the hour of their arrival. It cut down the air fleet, which it had been promised would greet the returning travelers, from a possible thirty-five planes and two dirigibles to ten planes, five of which made only a brief stay over the harbor before being forced to return to their hangars, and one "blimp." It denied the observers, massed on points of vantage ashore, the pleasure of more than the haziest glimpse of the ship's great bulk, as it slid, ghost-like, through the mist to Pier 4 at Hoboken.

Photo Underwood & Underwood.

Commanders and crews of the American NC planes, one of which, the NC-4, made the first trans-Atlantic flight, greeted in Washington by Secretary of the Navy Josephus Daniels

Seated, left to right: Secretary Daniels and Assistant Secretary Franklin D. Roosevelt, with (directly behind them) Lieut. Commander Albert Cushing Read of the NC-4 and Commander John H. Towers

Welcome Touches Fliers

Nevertheless, all circumstances considered, it was a real welcome, which made up in heartiness what it lacked in volume. And the home-coming flyers were touched by it.

Lieut.-Commander A. C. Read, captain and navigator of the NC-4, the flying boat which flew every inch of the way from Rockaway Point to Plymouth, England, is a man of impassive face and marked self-control; but there was a slight quiver of his lips when, on the pier, he received from Admiral James H. Glennon, speaking as Secretary Daniels's representative, the Nation's congratulations and thanks. A few minutes later, overwhelmed by handclasps and words of appreciation, he turned aside long enough to say to newspaper men:

"Well, I went over in a seaplane and came back in a Zeppelin. That's some round trip." And, becoming serious, he added:

"I regret that of the three planes that started only one arrived in England. Although we have had a wonderful reception abroad, I now realize that the real reception is just beginning. Now, I must go and see the best woman in the world; and as to my future plans, they will depend on the United States Navy and Mrs. Read."

Sighted Through Mist

Adverse weather conditions held the Zeppelin down to slow speed, and it was nearly noon when she was seen dimly through the mist off Rockaway. The big Navy dirigible, C-4, was serving then as her escort, having left its hangar at Rockaway Naval Air Station at 11.30. She picked up the Zeppelin a few miles to the eastward.

Before the transport was out of sight at Rockaway, five flying boats from the station had put out to augment the guard of honor up the bay, and a little later the cloud of torpedo-boat destroyers and submarine chasers detailed from the fleet to do the home-comers honor had formed about the ship.

There was one submarine chaser which had no place in the formation, but which focussed the eyes of the flyers from the moment she came into view. This was the Herreshoff, easily the center of sentimental interest of the whole celebration, because it bore the wives of six of the aviators and the children of two of them. It had set out from the Navy dock at 96th Street and the North River at noon and circled in the channel until the silver, cloud-like bulk of the C-4 against the somber sky revealed that the Zeppelin was approaching.

Aboard the Herreshoff were the wives of Commander John H. Towers and H. C. Richardson, Lieut. Commanders Read and P. N. L. Bellinger, Lieuts. James L. Breese, Jr., and Walter Hinton, with little Miss Margaret Richardson, aged eight, and Miss Frances Georges Breese, aged three. They and the wives of other officers of the flying boats' crews were the Navy's guests. Lieut. B. A. Mount, aide for aviation of the 3d Naval District, had charge of arrangements.

Wives Heedless of Rain

Rain was falling when word reached the cabin, where the party was huddled for protection, that the Zeppelin soon should be sighted. Mrs. Read was first on deck. Regardless of the effects on a smart new feather hat and dainty brown shoes, she found a place in the lee of the pilot house, as eager and happy as a girl at her first party.

"I never was so excited," she declared.

Mrs. Breese, who had followed her out, echoed

(*Continued on page* 16)

American System of Aircraft Employment

Tactics Used by the Army Air Service at the Front During the Great War

By Brigadier General William Mitchell

The three diagrams which are shown on the opposite page give graphically the system employed by the Air Service, A. E. F., in the employment of its aircraft forces in aerial operations.

Brig. Gen. Wm. Mitchell, Chief of Training and Operations Group

The top diagram represents a vertical section of the air as it would appear to one able to see every part of aviation on a good day during our operations of September, October and November, 1918.

The notch in the horizontal line indicates the trench or dividing line between hostile territory, which is on the right of the vertical line projected up above it, and friendly territory, which is on the left. On the ground the opposing infantries face each other on the trench lines.

Our 75 mm. and 155 mm. short artillery is shown with its average range of 5000 yd. into the enemy's territory. This is the artillery with which the Divisions of troops were equipped. The 155 long artillery, assigned to the Army Corps, shot upward of 12,000 yd. into the enemy's lines, whereas the Army artillery shot 25,000 yd. or more into the enemy's lines.

Anti-Aircraft Guns

The anti-aircraft machine guns are shown close to the troops, and the anti-aircraft artillery immediately behind them. The heights at which the various aircraft operate are indicated in meters. All of the observation planes, liaison, command, adjustment of artillery, and attack airplanes operate immediately in conjunction with the troops, while the low-flying pursuit planes, the medium altitude pursuit barrage, and the upper pursuit barrage protect these in their work. The special pursuit details, acting at great altitude, practically as high as they can get, work directly against the enemy's reconnaissance machines. Our own Army reconnaissance, acting up to 20,000 ft., habitually went thirty or forty miles into the enemy's territory. The Army's surveillance machines kept cruising over the front to report from their own position, by wireless, whatever they could see, so that it could be immediately attacked by our aviation elements. The pursuit and day bombardment elements, shown to the right of the diagram together, indicate the independent or strategical aviation, which acts by itself directly against the enemy aviation and his ground troops. It is in this class of aviation that the greatest development may be expected in the future, as it will be able to attack not only enemy air forces, but enemy ground troops and enemy naval formations.

Offensive Night Aviation

The middle diagram represents a cross section of an offensive operation at night. The various objectives were divided into three classes. First were the permanent targets such as railway stations, bridges and munition plants. The second class were the fugitive targets, which included troop concentrations, convoys on roads, railway trains in movement and troops on the march.

The last class of targets, the semi-permanent, were troops in bivouac, dumps of all kinds, ammunition depots, truck parks and semi-permanent river crossings. To attack these objectives we projected two kinds of night bombardment airplanes, namely, those carrying light weights, which could go very rapidly and maneuver well close to the ground, and those carrying very heavy weights, which could be used to attack objects difficult to destroy.

To pick up and report enemy fugitive targets quickly, the night surveillance ships were used, and, in order to neutralize the enemy's anti-aircraft and searchlights, direct attack was projected on these so as to throw them into confusion while our bombardment airplanes crossed these dangerous areas. Their airdromes were attacked by bombs and machine guns so as to destroy as much of their aviation as possible.

The light bombardment airplanes were equipped with six or eight guns, and the same bombardment appliances as were carried by day bombardment airplanes. The heavy night bombardment airplanes had additional gun defenses to the rear.

The objectives which were protected by anti-aircraft guns or searchlights were attacked by night pursuit planes. The surveillance airplanes were required to be exceptionally fast, and the type that probably would be best adapted for this work would be threee place equipped with powerful radio.

Defensive Night Aviation

The lowest diagram indicates the employment of air forces and ground aids for defensive night aviation. The German night bombardment had become so effective during 1917 and 1918 that effective methods had to be adopted to stop it.

American arrangements contemplated listening posts near the line; behind these, the zone in which anti-aircraft artillery worked; behind this, groups of searchlights fixed in position; behind these, pursuit patrols constantly in the air, and behind these, again, a group of mobile searchlights might move along the roads at great speed to protect specific areas being attacked, a reserve of pursuit airplanes, and balloon barrages, i. e., a curtain of wires raised by balloons around specific objects that it was desired to protect.

The method of operations was this: The listening post would hear a hostile airplane approach; it would "alert" the pursuit patrol which was assigned to the area in its vicinity by means of signals, and it would communicate its information to the anti-aircraft artillery, searchlights and airdromes. As soon as the direction of the hostile airplane was determined, information again would be sent to the pursuit patrols, anti-aircraft artillery and searchlights. As the hostile airplane crossed the line it would be taken under fire by the anti-aircraft artillery. The pursuit patrol would dive in that direction. As soon as the airplane had passed through the zone of the anti-aircraft artillery, it would be picked up by the searchlights and held in their beams while the pursuit patrol dived squarely into the ship.

This method of defense had just begun to work toward the end of our operations. Now that the war is over and officers who have seen active service in the air have an oportunity to give these problems study, a complete development of this employment will be made.

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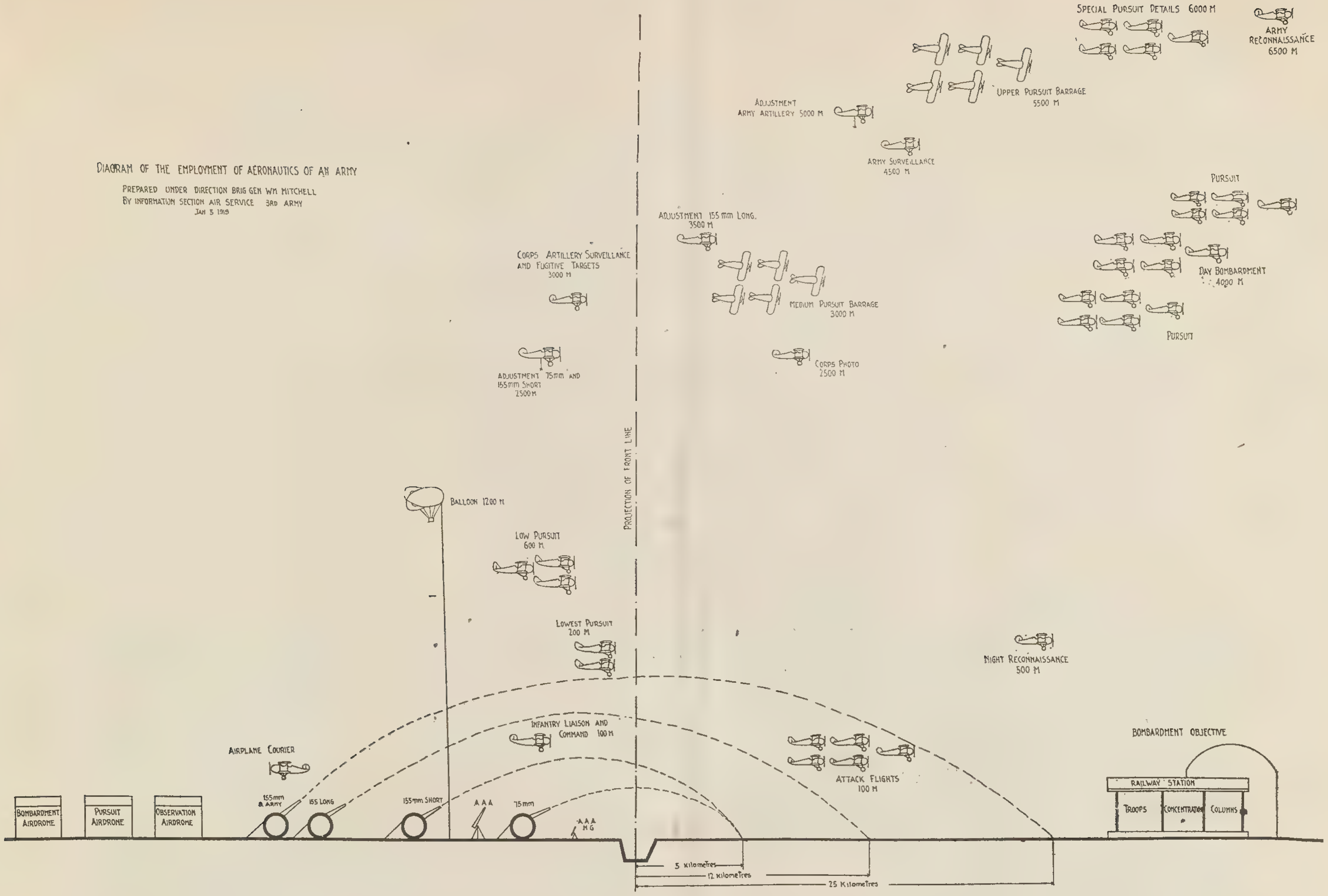
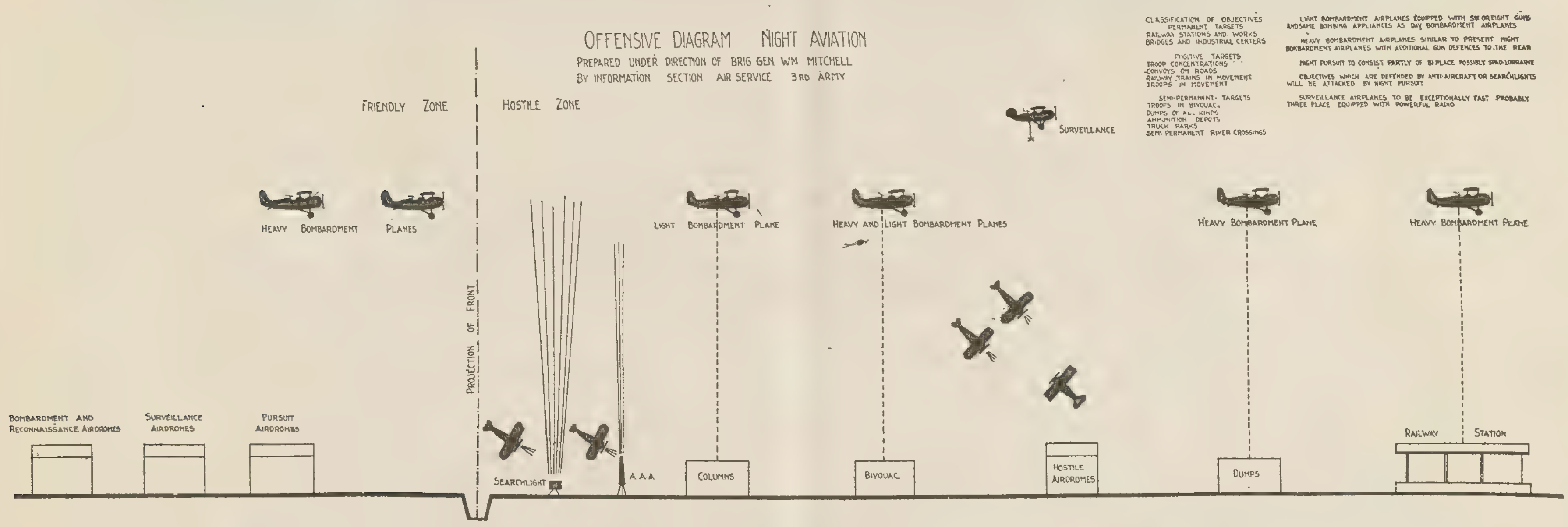


DIAGRAM OF THE EMPLOYMENT OF AERONAUTICS OF AN ARMY
PREPARED UNDER DIRECTION BRIG GEN WM MITCHELL
BY INFORMATION SECTION AIR SERVICE 3RD ARMY
JAN 5 1919



OFFENSIVE DIAGRAM NIGHT AVIATION
PREPARED UNDER DIRECTION OF BRIG GEN WM MITCHELL
BY INFORMATION SECTION AIR SERVICE 3RD ARMY

CLASSIFICATION OF OBJECTIVES

PERMANENT TARGETS
RAILWAY STATIONS AND WORKS
BRIDGES AND INDUSTRIAL CENTERS

FUGITIVE TARGETS
TROOP CONCENTRATIONS
CONVOYS ON ROADS
RAILWAY TRAINS IN MOVEMENT
TROOPS IN MOVEMENT

SEMI-PERMANENT TARGETS
TROOPS IN BIVOUAC
DUMPS OF ALL KINDS
AMMUNITION DEPOTS
TRUCK PARKS
SEMI PERMANENT RIVER CROSSINGS

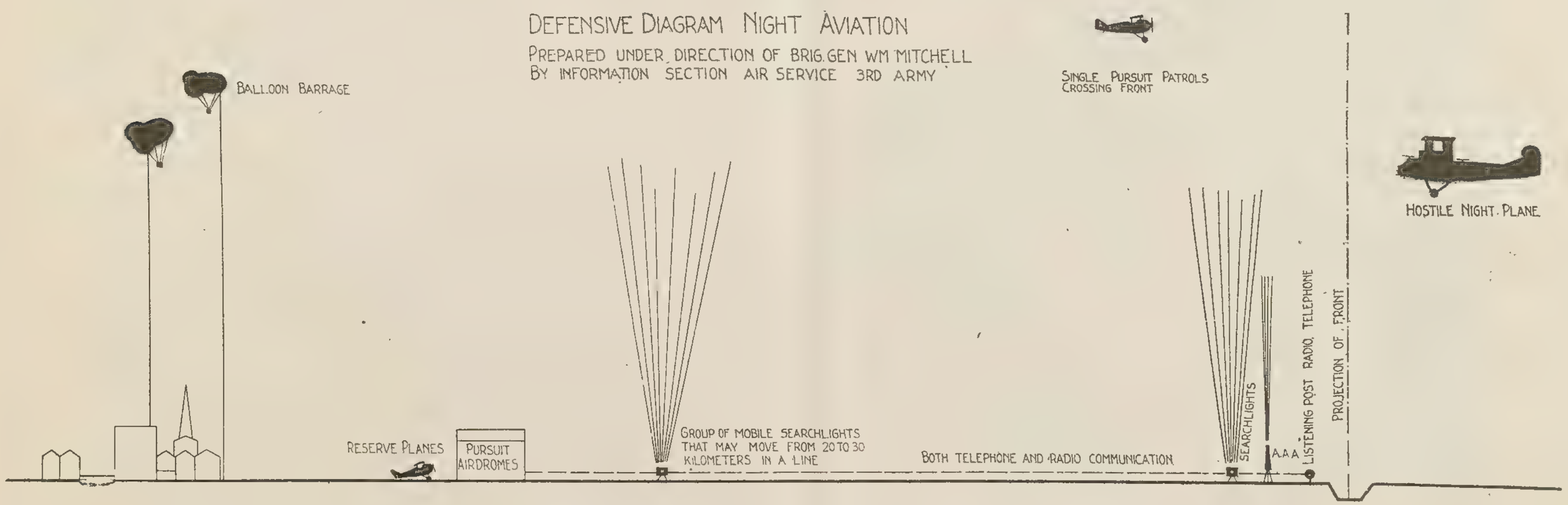
LIGHT BOMBARDMENT AIRPLANES EQUIPPED WITH SIX OR EIGHT GUNS AND SAME BOMBING APPLIANCES AS DAY BOMBARDMENT AIRPLANES

HEAVY BOMBARDMENT AIRPLANES SIMILAR TO PRESENT NIGHT BOMBARDMENT AIRPLANES WITH ADDITIONAL GUN DEFENCES TO THE REAR

NIGHT PURSUIT TO CONSIST PARTLY OF BI-PLACE POSSIBLY SPAD-LORRAINE

OBJECTIVES WHICH ARE DEFENDED BY ANTI-AIRCRAFT OR SEARCHLIGHTS WILL BE ATTACKED BY NIGHT PURSUIT

SURVEILLANCE AIRPLANES TO BE EXCEPTIONALLY FAST PROBABLY THREE PLACE EQUIPPED WITH POWERFUL RADIO



DEFENSIVE DIAGRAM NIGHT AVIATION
PREPARED UNDER DIRECTION OF BRIG. GEN WM MITCHELL
BY INFORMATION SECTION AIR SERVICE 3RD ARMY

BALLOON BARRAGE
SINGLE PURSUIT PATROLS CROSSING FRONT
HOSTILE NIGHT PLANE
RESERVE PLANES
PURSUIT AIRDROMES
GROUP OF MOBILE SEARCHLIGHTS THAT MAY MOVE FROM 20 TO 30 KILOMETERS IN A LINE
BOTH TELEPHONE AND RADIO COMMUNICATION
SEARCHLIGHTS
AAA
LISTENING POST RADIO TELEPHONE
PROJECTION OF FRONT

Diagram of the Employment of Aeronautics of an Army

Prepared Under Direction Brig. Gen. Wm. Mitchell by Information Section, Air Service, 3rd Army, January 5, 1919

The World's Airplanes and Seaplanes

The Le Pere Fighter—Model C-11

Group 2, No. 3.—The Le Pere Fighter—Model C-11

The Le Père fighter was designed by Captain G. Lepère, of the French air service, and is one of the most successful planes developed during the war. It is equipped with a Liberty "12" motor, and was designed for production in the United States. It was intended for use as a fighter or reconnaissance plane, and recent tests of performance and endurance show that it is well adapted for these requirements. The machine exhibits excellent flying qualities with ready response to the controls. All stunt manœuvers can be readily performed, and the overhead radiator installation affords excellent vision; in fact, most pilots who have flown this ship comment on these excellent qualities.

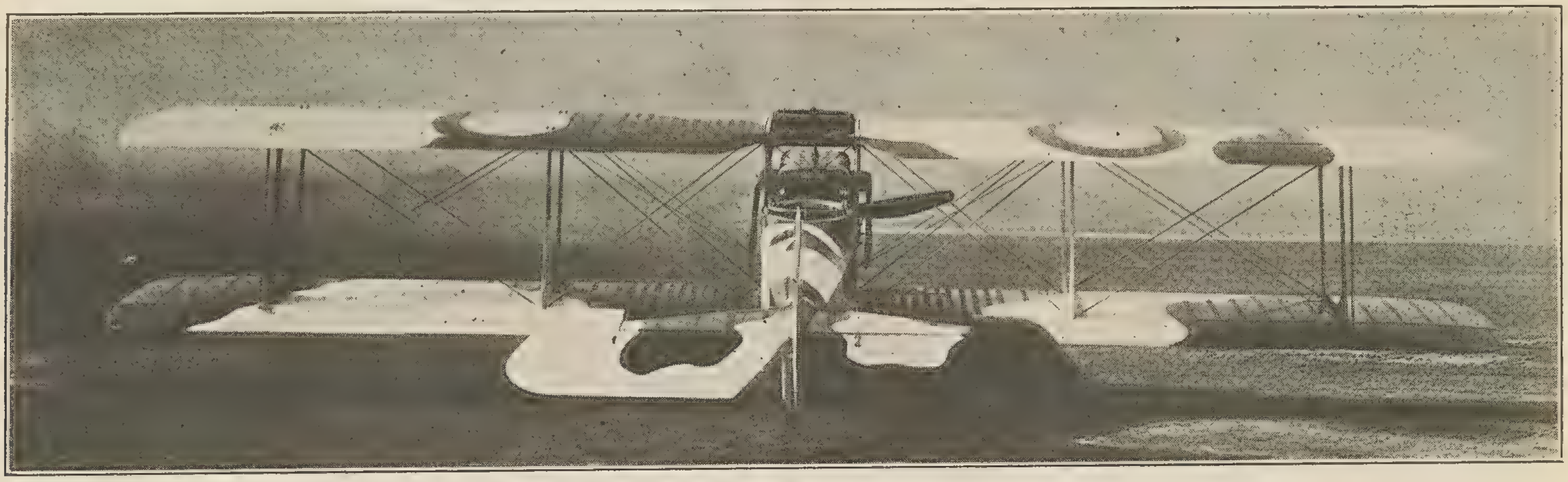


Fig. 1. Rear View of the Le Pere Two-Seater Fighter

POWER PLANT

Liberty 12-cylinder "V" type.
400 horse-power at 1700 r.p.m.
Weight, dry, 825 lbs.
Capacity of main fuel tank, 36 gals.
Capacity of reserve fuel tank, 37½ gals.
Capacity of oil tank, 5½ gals.
Vacuum feed for fuel tanks.

MAIN DIMENSIONS

Span, 41 ft. 7¼ in.
Overall length, 25 ft. 3⅛ in.
Overall height, 9 ft. 7 in. (standing on ground).
Stagger, 24 15/16 in.
Gap, 60⅝ in.
Area of upper plane, 206.8 sq. ft.
Area of lower plane, 208.6 sq. ft.
Angle of incidence (both planes), 1 degree.
Area of stabilizer, 17 sq. ft.
Area of elevator, 33.4 sq. ft.
Area of vertical fin, 3.4 sq. ft.
Area of rudder, 13.1 sq. ft.
Area of ailerons (both planes), 64.4 sq. ft.

MAIN WEIGHTS

Weight, empty	2468 lbs.
Fuel and oil	475 lbs.
Armament	352 lbs.
Pilot and passenger	360 lbs.
Total weight of machine	3665 lbs.

PERFORMANCE

Altitude (ft.)	Speed (m.p.h.)	Time
0	136	....
6000	132	5 min. 35 sec.
10000	127	10 min. 35 sec.
15000	118	19 min. 15 sec.
20000	102	41 min.

Theoretical ceiling	22,000 ft.
Service ceiling	20,800 ft.
Wing loading	7.05 lb./sq. ft.
Power loading	9.7 lb./h.p.

STRUCTURAL FEATURES

The wings of the Lepère fighter possess neither sweep-back nor dihedral. They are of conventional construction, the spars are of routed "I" section braced by the usual struts and wires. These wings are heavier than the average for a plane of this type, but they possess considerably more strength. The interplane struts are made of laminated spruce, and are unique inasmuch as they eliminate the usual incidence wires. These struts have the disadvantage of extra weight, but reduce the head resistance and have the advantage of simplicity. The center section struts are of similar type, but go down through the fuselage and rest on the heavy beams which connect through the spars of the lower wing.

The ailerons are connected by a streamline steel tube, and are controlled by means of steel tubes that run through the lower wing. The fuselage is

(*Continued on page 18*)

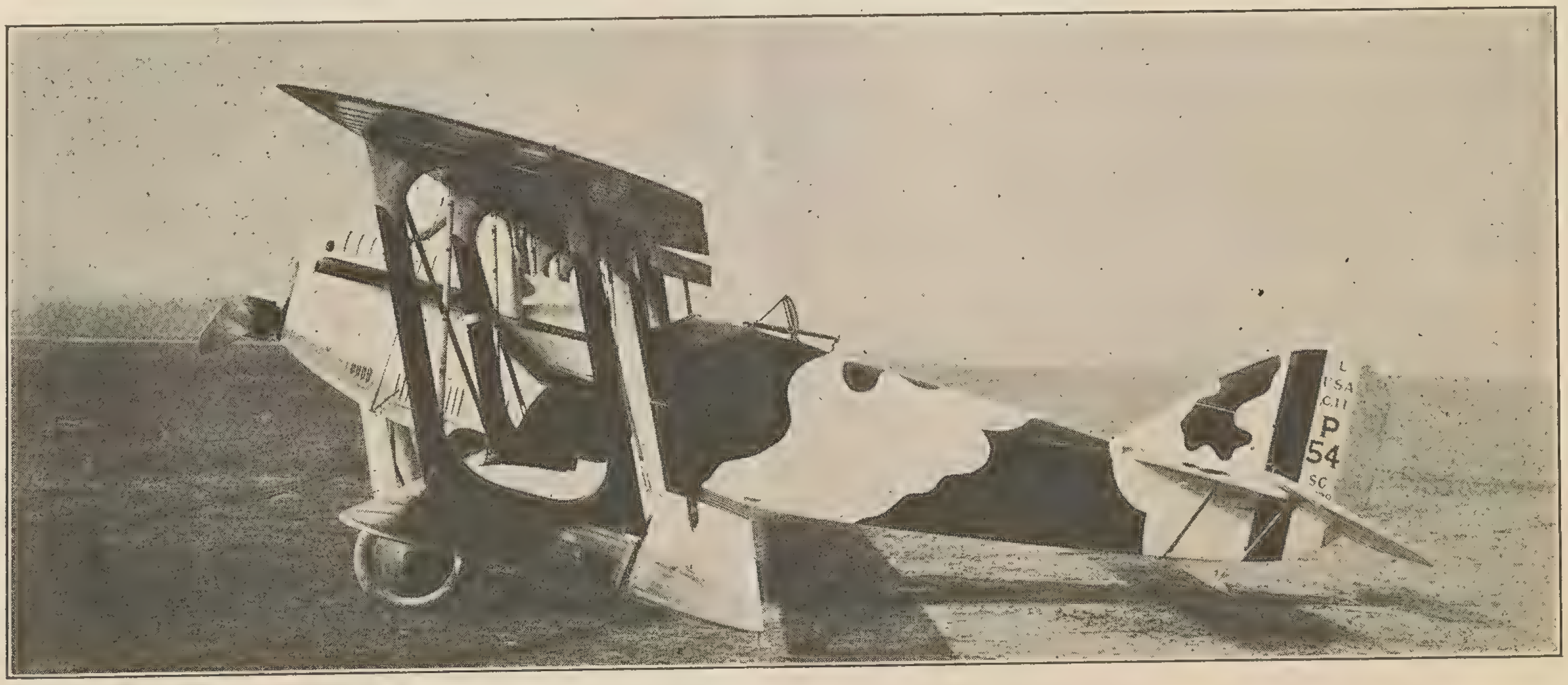


Fig. 2. Side View of the Le Pere Two-Seater Fighter

News of the Army and Navy Air Services

An Astonishing Statement

(From War Department News Bureau.)

The War Department authorizes publication of the following information on the service plane resources of the Air Service (see editorial on page 8):

On March 1, 1916, the total resources in planes of the Aviation Section, Signal Corps, was 13 airplanes, 4 hydroplanes, and one flying-boat.

On March 19, 1916, the first aero squadron went into Mexico with eight Curtiss JN-3 planes; a type now inferior to the primary training plane. After being in there two months, four more planes were shipped to them.

At the present time there are on hand in the United States 1,240 battle planes in serviceable condition; enough to make approximately 50 squadrons. Besides these there are in storage 862 battle planes that could be put into commission almost immediately.

The advanced training plane, of the type now used for forest patrol, could if necessary be used as an observation plane. Of these there are 653 in commission at the fields, and 156 in storage. A total of 52 squadrons of training planes could be assembled.

The resources of the Air Service in planes are as follows:

Type	Designed for	Number in commission	In storage with motors taken out	Total	Number of squadrons possible
DH-4	observation day bombing	1,191	842	2,033	81 1-3
Spad	Pursuit	27		27	1
Le Pere	Service	18		18	2-3
Handley Page	Bomber	4	20	24	1
S.E. 5	Advanced training	46	57	103	4
JN6-H	Advanced training	653	156	809	332
S4-C	Advanced training	400		400	16
Total		2,239	1,075	3,414	136

There are in the United States today 1,394 flying officers. This number includes flying officers on Staff duty, etc.

SOUTHERN DEPARTMENT

Information on the number of planes available in the Southern Department is given herewith. This, however, is not an accurate indication of strength immediately available, due to the fact that while there are sufficient planes and pilots for the planes, there is not sufficient enlisted personnel to take care of them without transfer from other branches of the service or recall of men furloughed to the reserve.

There are on duty now about 73 men with a squadron of ten planes and two or three other squadrons are being organized at various points in the Southern Department.

Following is a table of planes available, by types and fields, in the Southern Department, showing a total of 788 classed as active planes and 878 obsolescent. The 788 would be available for immediate use, and 878 could be used in addition if necessary.

Major Howard F. Wehrle, A. S. A.

Major Howard F. Wehrle entered the Curtiss School at Newport News, Va., April 2, 1916, and was a student of Steve MacGordon and Victor Carlstrom. He entered the federal service as First Lieutenant July 6, 1916, at Fort Monroe, Va., and was sent to Mineola, L. I. He stayed there fourteen months, and during that time was very active in construction work. He erected buildings and leased land for Aviation purposes, and was made Captain in the Reserve Corps, April 14, 1917.

Major Wehrle went to Kelly Field in September, 1917, to train recruits and get advanced flying training. Then he went to Fort Worth, Texas. He was adjutant of the American Headquarters in Fort Worth, and later was liaison officer while the R. F. C. was in Texas. He then became Commandant of the School of Aerial Gunnery, Taliaferro Field, where the first class of American cadets were graduated from an American gunnery school. Went over seas with Handley Page Training Department Station, No. 1, Headquarters, Touquiere Airdome, Chichester, Sussex, England. He has had 600 hours in the air.

Must Be Fit to Fly

The medical requirements which must be met by every candidate for a license as a pilot, navigator or engineer of aircraft engaged in public service, agreed upon by the International Aeronautical Convention, have been made public.

Isaac H. Jones and James B. Stanford signed the requirements on behalf of the United States; Great Britain was represented by Martin Flack and A. P. Bowdler; France by George Cuillain and Jules Levaire; Italy by Lieut. Col. Guideni, on behalf of di Nola and Mattoli, and Japan by K. Miura.

The medical requirements are designed to safeguard aerial navigation by preventing men who are physically or mentally disqualified from obtaining licenses to fly. They were worked out on behalf of the Aeronautical Commission of the Peace Conference by a technical sub-committee, in connection with the International Aeronautical Convention, which met in Paris in April.

Any state may increase the severity of the tests, but none can reduce it. The text follows:

"1. Every candidate before obtaining a license as a pilot, navigator or engineer of aircraft engaged in public transport will present himself for examination by specially qualified men (flight surgeons) appointed by or acting under the authority of the contracting state.

Good Character Necessary

"2. Medical supervision, both for the selection and the maintenance of efficiency, shall be based upon the following requirements of mental and physical fitness:

"(a) Good family and personal history, with particular reference to nervous stability. Absence of any mental, moral or physical defect which will interfere with flying efficiency.

"(b) Minimum age for pilots and navigators engaged in public transport shall be nineteen (19) years.

"(c) General surgical examination: The aeronaut must neither suffer from any wound, injury or operation, nor possess any abnormality, congenital or otherwise, which will interfere with the efficient and safe handling of aircraft.

"(d) General medical examination: The aeronaut must not suffer from any disease or disability which renders him liable suddenly to become incompetent in the management of aircraft. He must possess heart, lungs, kidneys and nervous system capable of withstanding the effects of altitude and also the effects of prolonged flight.

"(e) Eye examination: The aeronaut must possess a degree of visual acuity compatible with the efficient performance of his duties. No pilot or navigator shall have more than two (2) dioptres of latent hypermetropia; muscle balance must be good and commensurate with refraction. He must have a good field of vision in each eye, and must possess normal color perception.

Hearing Must Be Good

"(f) Ear examination: The middle ear must be healthy. The aeronaut must possess a degree of auditory acuity compatible with the efficient performance of his duties.

"(g) The vestibular mechanism must be intact and neither unduly hypersensitive nor hyposensitive.

"(h) Nose and throat examination: The aeronaut must possess free nasal air entry on either side, and not suffer from serious acute or chronic affections of the upper respiratory tract.

"3. Each contracting state shall for the present fix its own methods of examination until the details of tests and the minimal standard of requirements have been finally settled by the authorized medical representative of the I. C. A. N.

"4. The successful candidate will receive a medical certificate of acceptance, which must be produced before the license can be issued.

Test Every Six Months

"5. In order to insure maintenance of efficiency, every aeronaut shall be re-examined periodically, at least every six months, and the findings attached to his original record. In case of illness or accident, also, an aeronaut shall be re-examined and pronounced fit before resuming aerial duties. The date and result of each re-examination shall be recorded on the aeronaut's flying certificate.

"6. No aeronaut who, before the date of the present convention, has given proof of his flying ability shall so long as he retains such ability be necessarily disqualified because he fails to fulfill all of the above requirements.

"7. Each contracting state may raise the conditions set forth above as it deems fit, but these minimal requirements shall be maintained internationally."

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Formerly Air Service Journal

A Very Misleading Statement

AGAIN the War Department is giving out statements regarding the airplane equipment of this country which can be and have been misconstrued by those who know nothing about the essential differences of the types of airplanes. Newspapers have stated "that should an emergency arise to-day there would be available for instant duty—as soon as the fliers could be put down at the hangars a total of 1,240 'battle planes' or enough for fifty squadrons. These would give a greater concentration of air strength than was used by the American forces in the St. Mihiel drive, and that engagement still is cited as the peak of air offensives."

A more careful perusal of the official statement indicates the following startling situation regarding the air defence of this country. To-day, we have twenty-seven Spads or enough for only one pursuit squadron. Two-thirds of a "Service" Squadron could be assembled with Le Peres. As for bombing squadrons we have in commission four Handey Pages or enough for one-sixth of a bombing squadron. And yet the War Department proudly announces that "at the present time there are on hand in the United States 1,240 battle planes in a serviceable condition; enough to make approximately 50 squadrons."

This statement is so open to misinterpretation that those who believe that the United States today is defenseless in the air should protest that the public be not further misled by the misnomer "battle planes." If the Navy were to give out a statement that it had fifty fighting units available for instant service and that these units were composed of 97 per cent scout ships with the three per cent representing the battle ships, cruisers, destroyers and all other naval craft, the situation would parallel the present statement of the War Department.

In this issue, there is published three diagrams of American aviation employment and the clearest of all lessons to be drawn from them is the necessity of "balance" in the various types of squadrons used in aerial warfare. Against an enemy equipped with the latest pursuit types of battleplanes the fifty squadrons of D. H.-4s would be wiped out so fast that the whole nation would shudder.

Of these D. H.-4's, Captain E. V. Rickenbacker in his book "Fighting the Flying Circus" says: "From every side Fokkers were piquing upon the clumsy Liberty machines which, with their criminally constructed fuel tanks, offered so easy a target to the incendiary bullets of the enemy that their unfortunate pilots called this boasted achievement of our Aviation Department their 'flaming coffins.' During that one brief fight over Grand Pre, I saw three of these crude machines go down in flames, an American pilot and an American gunner in each 'flaming coffin' dying this frightful and needless death."

The public has confidence in the future of aviation and is willing to believe in the great possibilities of the Air Service, but the War Department publicity on aviation during the war was at times so astonishingly misleading that statements regarding the availability of aircraft for service are not generally given credence. It is to be hoped that no more of this kind of publicity will be given out and that when the War Department uses the term "battle plane" it will not do so to cover up the shocking condition that the Air Service now finds itself in for fighting planes.

Mr. Grey's Explanation

It is with great pleasure that we print the reply of Charles Grey of *The Aeroplane* to an editorial in the AIRCRAFT JOURNAL criticizing his warning to British Transatlantic aviators regarding sabotage in case they came to the United States. His explanation of his attitude is so fair and sportsmanlike that his numerous friends in this country will be glad, as we are, to know that once more a misunderstanding has been cleared up. For our part, our admiration for Charles Grey, which has always been strong, has been increased greatly by his splendid reply:

June 12, 1919.

The Editor, AIRCRAFT JOURNAL,
22 East Seventeenth Street, New York.

Dear Sir:

I note with much interest in your issue of May 24 some rather trenchant remarks on a note of mine in *The Aeroplane* warning trans-Atlantic competitors against "Sabotage" on your side of the Atlantic.

In your attack you say that I evidently do not know much about conditions in the United States nor American sporting characteristics. You also suggest that the article is intended to afford some excuse for the failure of the English contestants to make good. Further you suggest that what you are pleased to call my "show of ill-temper" is due to the fact that the American Navy was about to make its attempt while English commercial concerns were striving for a 50,000 dollar prize. Also you state that I. W. W. propaganda has found fertile soil in piqued minds and that the alleged success of U. S. constructors and pilots has caused what you describe as "this flow of venom."

Will you permit me to explain to your readers that there is no venom in the article and that there was no pique in my mind when I wrote it. It was a perfectly plain straight warning against what was likely to happen. Whenever there is big money at stake there is also danger of "sabotage." We know just as much about doping horses in this country to stop them from winning races, as you do in the States. "Sabotage" is a French expression, which indicates that "sabotage" is known even among our gallant Allies the French, but it is by no means a speciality of the French people. I have known cases of "sabotage" on aeroplanes in this country, when men have disliked their officers, and when men in a firm's employ have had money on that firm's machines in sporting events. I have known "sabotage" in France, when there has been competition for Government orders between French and British constructors during the war, and I have known "sabotage" between one French constructor and another in sporting events before the war.

And, unless you have got what we in England call a "Non-Conformist Conscience" pretty badly developed, you are not going to pretend that "sabotage" and doping has not been known in America in connection with sporting events whether horse racing or motor racing, so why should you try and pretend that "sabotage" in an aeroplane event is unthinkable?

How little personal feeling there was in my article you may judge from what you have probably read in *The Aeroplane* since then about the defeat of the Atlantic by the American Navy, and I should like to take this opportunity of congratulating all concerned with American aviation on having given us a fair and square licking at the game at which we fancied ourselves most.

Yours faithfully,

CHARLES GREY,
Editor, *The Aeroplane.*

Postal Mail

THE criticism of the safety of the postal mail service because of the burning of a mail pouch en route from New York to Chicago containing valuable vouchers is to be considered in the light of another attack on the Postmaster General. So long as mail is transported by trains, ships and airplanes, there are going to be wrecks and destruction of mail. The fact that thirty-five mail cars have been destroyed this year by fire as against one airplane pouch indicates that every form of transportation has its dangers.

Notes on Technical Aeronautics

Metal Construction in Aircraft

The following abstract of a recent paper by Dr. A. P. Thurston before the Royal Aeronautical Society is of interest at the present moment:

It is quite evident from observations carried on at the Front that wood is a most unsatisfactory material for airplane construction. It splinters easily in a crash; is uncertain in strength and weight; was found to warp and crack in the varying climate of France and Italy, where machines were kept in readiness on the open field in all sorts of weather, and were actually flown for hours at a time in blinding snowstorms and rainstorms; while the hot, soggy tropical climate of Turkey and Egypt attacked the comparatively delicate structure and weakened it considerably.

On the other hand, metal does not splinter, it is much safer in a crash, the members hang together and so protect the passengers; its properties are known to a fine degree and can be relied upon; the effect of varying temperatures is negligible; and it can be produced in immense quantities. Certain types of French all-metal machines have performed wonderfully and have withstood the most trying tests, comprising both extreme weather conditions and violent maneuvers.

Many designers are under the impression that metal is too heavy to construct efficient flying machines. Experiments have proved that any wooden part can be duplicated in metal with less weight and considerably more strength. As a matter of fact, one of the strongest machines yet made by any concern, and loaded until broken, is an all-metal machine constructed by Messrs. Vickers, and this machine is lighter than the standard wooden model.

The advantages of metal construction are not confined to greater strength, lightness, reliability, and ultimate cheapness. Its use will enable many new developments to be made in the actual design of the machine, such as variable camber, variable incidence, etc., and some of the greatest constructional difficulties encountered will be obviated by this method.

Different metals are employed for this purpose, the more important being steel and duralumin. The latter is lighter than steel and has the advantage in this respect, in as much as a section three times as thick can be used for the same weight. A prejudice appears in certain quarters against duralumin owing to the fear of corrosion. Duralumin, if properly varnished, is not affected by corrosion under ordinary service conditions. There are several processes for the manufacture of steel for aircraft construction. One process is by cold rolling and Blueing simple carbon steels, while a second process is by continuous quenching and annealing low and medium carbon steel strip.

Many metal spars have been produced, the most efficient being corrugated steel strips, riveted or welded into box or "x" shapes. Fig. 1 shows several typical wing spar sections. In deep wing sections spars are made up in girder form. Considerable difficulty was originally experienced in the design of fittings, but present practise has eliminated this. On some of the reconstructed models, the spars, longerons and struts were so designed that the original fittings could be utilized.

The solution of the strut problem is much simpler than the wing spar. Built up steel struts are rapidly replacing the steel tube struts with fairing on the back and front. A few of these types are shown in Figs. 2, 3, 4.

Rapid strides are being made at present in all-metal aircraft, especially the larger machines, and there is a very interesting outlook for this form of constrution in all aeronautical designing.

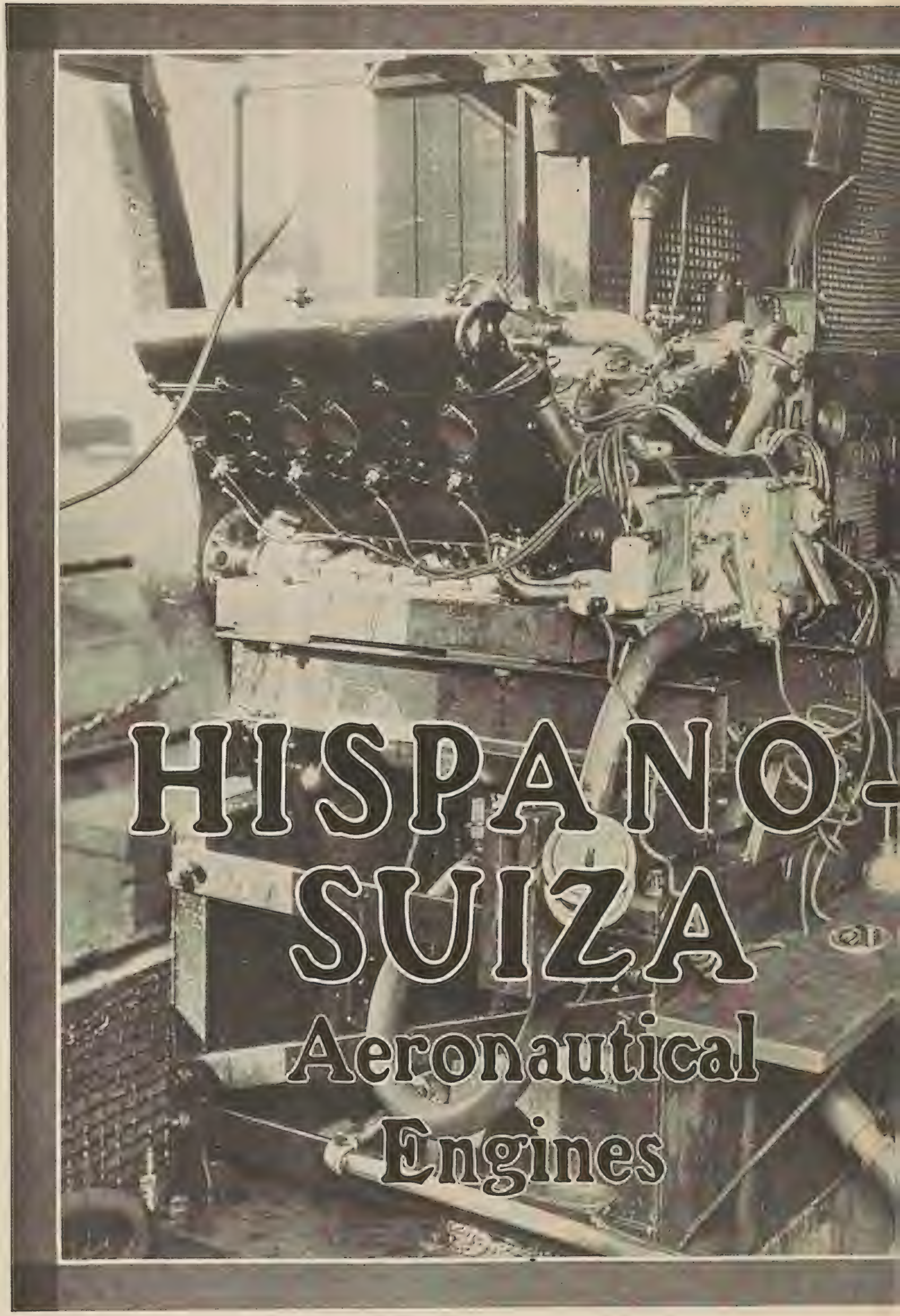
(C) *Underwood & Underwood.*

Men of the British Royal Air Forces at work on the moorings on Roosevelt Field, Mineola, which are to hold the giant British airship R-34 on its arrival here.

The R-34, one of the largest units of the Airship Section, Royal Air Force, was launched March 14, 1919, at the Glasgow works of William Beardmore and Co., Ltd. She is 665 ft. from nose to stern, 80 ft. at the master diameter, about 90 ft. high, and has a gas capacity of 2,000,000 cu. ft. Filled with hydrogen, the R-34 has a gross lift of 60 tons, while the disposable lift, or useful load is 29 tons. The power plant consists of four Sunbeam "Maori" engines, each of which develops 275 hp. at 2100 r.p.m. and drives a pusher airscrew. The forward car, which contains the navigation room, the two wing cars, and the after car each are equipped with one engine. The high speed is about 80 m.p.h.

(C) *Underwood & Underwood.*

Lieut. Col. Luccas (left) and Major Fuller, British Officers Who Are Here Preparing for Arrival of British Rigid Dirigible R-34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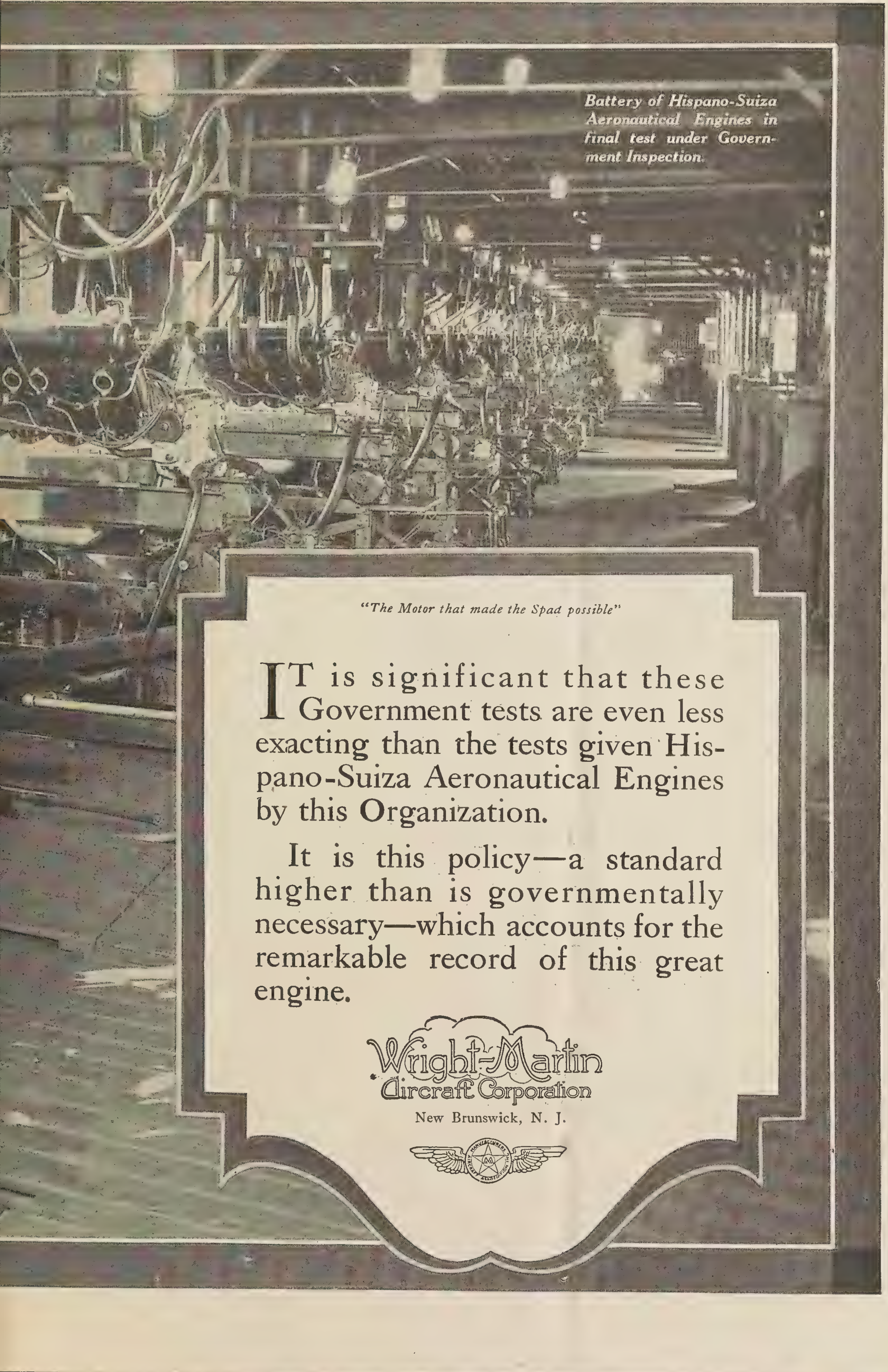

Battery of Hispano-Suiza Aeronautical Engines in final test under Government Inspection.

"The Motor that made the Spad possible"

IT is significant that these Government tests are even less exacting than the tests given Hispano-Suiza Aeronautical Engines by this Organization.

It is this policy—a standard higher than is governmentally necessary—which accounts for the remarkable record of this great engine.

Wright-Martin
Aircraft Corporation
New Brunswick, N. J.

Maintaining America's Supremacy in the Air

What Is Meant by the Word "Superiority," and What Constitutes the Functions of the Air Service

By Lieut.-Col. Benj. F. Castle, J. M. A.

Prior to the European War there were but two great divisions of the defenses of a nation—those on the land and those on the sea. The conclusion of the War finds us with a third and important element which must enter into all plans for the future—the air defenses. Helpless, indeed, will be the nation which fails to realize the importance of providing security against air attack. Land troops are limited in their field of effective operation by the physical and artificial aspects of the terrain. No more than a certain number of combatant troops can be used effectively on a given front. The size of the sea fleet is determined by the strength of the fleets of the navies of other nations. America thus far has conceded mastery of the seas to Great Britain, but our future naval policy may change this condition. We concede that Great Britain's very existence is dependent upon her sea supremacy, but in view of the great extent of our own coast lines, and the wide distribution of stratgetic points over which our flag flies outside our continental boundaries, we realize that no power other than Great Britain must be able to threaten our security by the possession of a navy superior to our own.

NEW YORK CITY'S AIR POLICE CORPS

New York is the first city in the world to introduce "fly" cops in the highest sense of the word. Two Curtiss JN-4D training planes, piloted by A. Livingston Allan and Joseph D. Bennett, lieutenants in the Aerial Police Reserves recently carried Police Inspector John F. Dwyer of the New York Police and Major Dinshah P. Ghadiali, governor of the Wanamaker Aviation School, from Sheepshead Bay to Philadelphia.

The Aviation School of the Police Reserve was founded by Special Deputy Police Commissioner Rodman Wanamaker with a view of training aviators for the government while the war was going on. It will be used in the future to train aviators for the Police Department.

"It will only be a short time until aerial traffic policemen will be on duty in the air over New York City," said Commissioner Wanamaker, "to control and regulate traffic."

The use of the machines was donated by J. P. Davies of the Curtiss Aeroplane and Motor Corporation.

Thus America has determined upon the relative strength of her naval forces. How shall she determine the strength of her air fleet? Upon the wisdom of her present decision may depend the very life of our nation in the future, for who is there unwilling to admit that the full development of the strategic and tactical use of air forces is still in its infancy? The next war will see air armadas striving for the mastery of the air, and that mastery, once attacked, will be more decisive as a factor of victory than the mastery of the seas was for the Allies during the European War.

Our present problem is to decide what the strength of the U. S. air defenses should be in time of peace to insure "superiority in the air" in the hour of need. What is meant by "superiority in the air?" Does it mean more pilots than the adversary has? No, not unless our pilots are at least as well trained as those of the enemy. If they are less skillful, they will only increase the size of the enemy's "bag." Does it mean more airplanes than the enemy possesses? No, unless they are as fast and as manoeuverable as those he possesses. If they are inferior to his in these respects they are valueless as fighting machines, for they will never be able to carry out an offensive role. Superiority of the air, then, means both better trained personnel and better machines available *at the time* when superiority is desired. The obvious means, then, of insuring air superiority for our nation when it shall be needed is to provide a nucleus of highly trained personnel and to develop aviation material continuously in time of peace, so as to keep abreast of every other nation in this respect.

What shall be the strength of the air force? Before replying to this question, the military man naturally reverts to the basis of all land army organization—the infantry divisions. An army is a great team built up about its infantry. He will therefore consider the number of infantry divisions deemed sufficient to defend his country, work out the proportionate artillery strength, and from the resulting figures decide upon the necessary air force component of a well balanced army. So far so good. But has he considered the fact that the air force has, in addition to its duties as a component of the land army, its own *independent* role in the air? Here we have touched the essential thing that must be thoroughly appreciated by those charged with the duty of determining the size of the peace-time air force—the air force has an *independent* as well as a co-operative role to play in time of war.

The functions of the Air Service are more varied than those of any other arm. It has been called the "Cavalry of the Clouds," but this name is only indicative of one of its roles. It can equally happily be called the infantry of the air, or the artillery that flies. It photographs and observes for artillery, it maintains contact for and fights with infantry, it attacks the enemy's air force and bombs his factories, storehouses, and lines of communication. What other branch of the land army has so comprehensive a role? None. Only an army as a whole can have it. There is the crux of the question. The air force by its role as well as by its sphere of operation is defined as a separate component of the national defense,—completely capable of independent action.

Its Mission

What will be the mission of the Air Service in time of war? Its mission will be:

1. To function as a component part of the land army as:

    (a) The air *contact* for infantry. Keeping the infantry informed of the enemy's movements and location, and, of the movements and location of our troops. Fighting with the infantry by attacking hostile groups, machine gun nests, etc. Supplying the infantry with its life blood—food and ammunition—when the normal arteries of supply are severed in the course of battle.

    (b) As the *service of information* for division, corps, and army commanders. Observing and instantly reporting, from balloons and airplanes, every visible move of the enemy; revealing his nocturnal works by means of aerial photographs interpreted by its skilled observers.

    (c) As the *fire directing* agency for the field artillery. Locating targets and subsequently conducting the "shoot" against them by reporting the location of every shot-strike.

    (d) As the *fire directing* agency for the Coast Artillery.

    (e) As a weapon of offense and defense in the hands of corps and army commanders who make use of its extreme mobility to effect sudden and overwhelming concentrations against enemy air forces, ground troops, and strategic points in the zone of operations.

2. To provide protection for our long coast line and extensive coastwise traffic against attack by foreign submarines and aircraft.

3. To secure our naval bases against attack from the air.

4. *Independently,* to hasten the termination of the war by the accomplishment of its chief and most important mission, which is to seek out and destroy the very sources of enemy strength—his air forces, his oil wells, mines, munition factories, railroads, canals, and harbor works.

Is any arm of our national defense charged with a broader mission? Will the Air Service be prepared to carry out its mission if it is not organized in time of peace so that it can strike with instant effectiveness when national emergency demands its use?

Organization

Fresh from the lessons of the recent war, we have no uncertainty as to the *kind* of organization needed for an air force. The number and kinds of air units for a mobile army of a given size are fixed by our Tables of Organization. There is no military or historical precedent, however, for the establishment of the limits which should mark the peace-time strength of the *independent* component of the air force. The stronger we make this the greater will be our chance of impressing other nations with our impregnability, and of removing from hostile and covetous minds any hope of successful attack. America finds herself in a fortunate position at the present time. She has recreated her merchant marine and built up her Navy. She has built up an aircraft industry that is capable of insuring her mastery of the air, and *she has the potential* and *actual wealth* that makes it possible for her to continue them *all* and absolutely assure the peace of the western hemisphere if not of the world.

General Mitchell Cited

Following is Gen. John J. Pershing's citation of Brig.-Gen. William Mitchell, now chief of the Training and Operations Group of the Army Air Service:

GENERAL HEADQUARTERS AMERICAN EXPEDITIONARY FORCES,
PERSONNEL DIVISION, DECORATIONS SECTION.
FRANCE, 27 May, 1919.
By Courier.

From: The Adjutant-General, American E. F.,
To: Brigadier-General William Mitchell, U. S. A. (Through the Adjutant-General of the Army.)
Subject: Distinguished Service Medal.

1. Under the provisions of Cablegram No. 2830, received from the War Department, March 1, 1919, the Commander-in-Chief, in the name of the President, has awarded the Distinguished Service Medal to you for exceptionally meritorious and distinguished services as set forth below:

BRIGADIER-GENERAL WILLIAM MITCHELL,
U. S. A.

For exceptionally meritorious and distinguished services.

As Air Service Commander, first of the Zone of Advance, and later of the First Corps, by his tireless energy and keen perception he performed duties of great importance with marked ability. Subsequently as Commander, Air Service of the First Army, and, in addition, after formation of the Second Army as Commander of Air Service of both armies, by his able direction of these vitally important services he proved to be a potent factor in the successes achieved during the operations of the American Armies.

2. You will be informed later in regard to the time and place of presentation of the Medal awarded you.

By Command of General Pershing.

(Signed) F. C. WHITLEY,
Adjutant-General.

To Meet the R-34

The British dirigible R-34 is now expected to leave England on its cruise to the United States July 4. Plans for an aerial escort for the R-34, made when the flight was expected two weeks ago, have been revived, and orders have been issued to have a dirigible from the Rockaway station meet the visiting airship as far out to sea as possible, piloting it to the landing field at Mineola. Rockaway, Montauk and Chatham Naval air stations will send as many seaplanes as available to participate in a welcome and escorting demonstration.

Rohlfs' Altitude Attempt

Roland Rohlfs, Curtiss test pilot, who will attempt to establish a new altitude record in a Curtiss "Wasp," one of the new models developed at the time of the signing of the armistice, expects to make his flight within a few days. He will try to climb 34,000 ft. in order to break the record of 33,132 ft., made recently by Casale, a French pilot. Major R. W. Schroeder of the United States air service holds the American record of 28,900 ft.

The instruments used in altitude tests include: Water thermometer to tell temperature of water circulating through the motor. Time clock. A 30,000-ft. aneroid to inform the pilot as to his levels. Two 34,000-ft. baragraphs which record altitude. Oil pressure gage. A tachometer recording the revolutions of the motor. A gas-pressure gage. A compass. An air speed indicator. A statoscope.

Blimp Air Line

A small dirigible is to make the trip from Kansas City to Fort Worth early in July, preparatory to establishing a passenger air service in September, says Charles Ora, manager for a commercial airship syndicate at Kansas City.

Ora says the company has ordered a "sport blimp" built.

New York Landing Fields

A proposal to establish municipal airplane landing fields in co-operation with the Federal Government has been presented to the Board of Estimate of New York City by Comptroller Craig, who declared that the establishment of such fields, "was worthy of serious attention.

"It is only a matter of a few years before aerial intercity transportation, express service, mail service, emergency service and local photographic mapping, as well as aerial protection will be a part of the activities of every city government," Comptroller Craig added. "Assurance is given that neither the air service of the War Department nor the Post Office Department will deal with any private individual, society or corporation in the matter of landing fields."

The Comptroller's proposal was prompted by a communication he received from Major Gen. Charles T. Menoher, Director of Air Service, U. S. A., who said that should the city decide to cooperate with the Government in establishing landing fields the Army will obligate itself to furnish hangars to be erected on the fields at the expense of the city.

The Army will also ask the city to bear the expense for establishing landing fields and the maintenance of both the fields and the equipment exclusive of airplanes.

Sermon from a Dirigible

From 300 ft. above an immense crowd at the Methodist centenary celebration at Columbus, Ohio, June 27, Dr. Edward Soper delivered a sermon through a megaphone from the big Army dirigible A-4, which came to Columbus from Akron under command of Major Clarence Maranville. Dr. Soper's voice could be distinctly heard. The sermon was about 300 words in length.

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AVIATION DEPARTMENT

Is now issuing policies covering the following hazards to aircraft:

1. Fire and Transportation
2. Collision (damage sustained by the plane itself)
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Additional coverage may be had against loss by windstorm, cyclone or tornado.

AUSTEN B. CREHORE, Manager, Aviation Department.
For two years pilot in Lafayette Flying Corps
and previously with this company since 1910.

We should be glad to discuss with those interested the various phases of insurance on Aircraft.

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America's Opportunity

With the first non-stop flight across the Atlantic accomplished by Captain Jack Alcock showing the advance which has been made in aeronautical construction, it now rests with this country to realize what great possibilities rest in the commercialization of aircraft in every field for which it is adapted—commerce, sport, recreation—in the opinion of Harry E. Tudor of the Aircraft Department of the Maryland Pressed Steel Co. The field is a wide one, he says, and the United States has the real material in thousands of experienced aviators. It will be a loss to aviation and the country, Mr. Tudor believes, if these highly trained young men have to go back to the work they did before the war.

He does not think there will be any great rush by the public to take pleasure or business trips to Europe by the air, despite the recent success won by Captain Alcock and Lieutenant Commander Read in their crossings by air.

Germany Always "Under Cover"

"With the successful flight of the 'Vimy' the applauding world will, unanimously, say 'what next?'" Mr. Tudor said: "The failure of Hawker, his sensational rescue, the crossing of the NC-4, and the recording of the first 'non-stop' has served to crowd years of aeronautical history into the time space of one month exactly. The main achievement has been a feast of press publicity—that dominating factor of all human success in every line of endeavor of our supermodern days. It may be added that a most excellent antidote has been provided for a war tired world in assisting the regaining of national equilibrium.

"All has been as might have been anticipated. Europe's years of preparation for the materializing of the 'German Invasion Bogie,' provided for inter-European competition in the designing of war craft of every kind, and proper attention was given to the aerial possibilities. The antewar days flying fields of the nations that became, subsequently, grouped under the title of 'The Allies' welcomed all-comers. Germany and Austria did not respond. Signs were not awaiting by any means of what was destined to come. Astute Germany was the first purchaser of Britain's first seaplane, and the somnolent British Government woke up. Mysterious lights were seen in the sky, at nights, for months before the war's outbreak, over various parts of Britain that could find no accounting, but one.

First "Airobat" Arrested

"At times, stories of unbelievable altitude and endurance records, 'made in Germany,' were discussed. Other stories of gun practice from the 'silent grey monsters' over Lake Constance were told by tourists and regarded by the conservative British press as travellers' tales. Brusiloff, a lieutenant of the Russian flying corps, looped the loop, and was given some months of imprisonment for 'unnecessary endangering of Government property.' Credit for the first execution of this feat was given to the French airman Pegaud, but such belonged to his less fortunate comrade of the air.

"The Government need not, necessarily, assist civilian aviation beyond a moral encouragement of it in many obvious directions. It is a matter of municipal bodies, Chambers of Commerce, Boards of Trade and a prompt recognition of the fact that, before long, 'landing facilities' for airplanes will form close seconds to railway depots and sidings. Private enterprises, throughout the United States are already accounting for financially backed 'Aerial Transportation Lines' and the linking of cities, necessarily rests with provisions for 'airline stations.' No city is too small to permit itself to be considered as inconsequent in this direction.

Greater Scope Offered Here

"No necessity to say 'Look what they are doing in Europe.' America offers greater scope and American enterprise can find a hundred more ways of applying aviation to commercial endeavor. One has only to appreciate the ambitions of the retired air service men to recognize that such provides the greatest factor of all in the immediate present and future of the possibilities of commercializing aircraft.

"Beyond its recording the advance of aeronautical design, the actual airplane that has accomplished a nonstop flight across the Atlantic counts but little in comparison with the value as an object lesson. It is, purely and simply, the basis of most excellent advertisement copy and of a value that cannot be overestimated in the competition between the respective entrants for the Daily Mail's cash prize of $50,000.

New Fields Opened Up

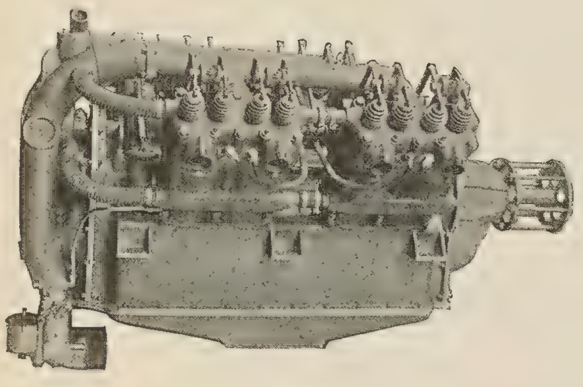
"I do not assume that there will be a wild desire by thousands of Britishers and Americans to undertake similar trips for business or pleasure reasons, nor that there is any possibility, for some time to come, at least, of 'aerial ocean fliers' competing with the steamship lines for passenger business.

"To sum up, Hawker, Read and Alcock have made history in proving that the airplane engine has attained a proficiency in reliability that is of supreme importance in adapting aircraft to the varied uses it may have in scientific research, commerce, sport and recreation. It is now a matter of applying the lesson with the proverbial enterprise of the United States in fields where enterprise counts."

Enviable Service Record

The employees of the Ericsson Mfg. Co., Buffalo, N. Y., manufacturers of the well-known Berling Magneto, put their company over as a 100 per cent American concern in the Victory Loan.

Not content with a high average for the other four loans and an enviable record for Magneto production for our government during the war period when the entire energies of this company were devoted to the task of meeting the government demand for magnetos, for aeronautical, truck and marine service, they cheerfully subscribed to the Victory Loan. The average for the entire company was nearly $125 for each employee.



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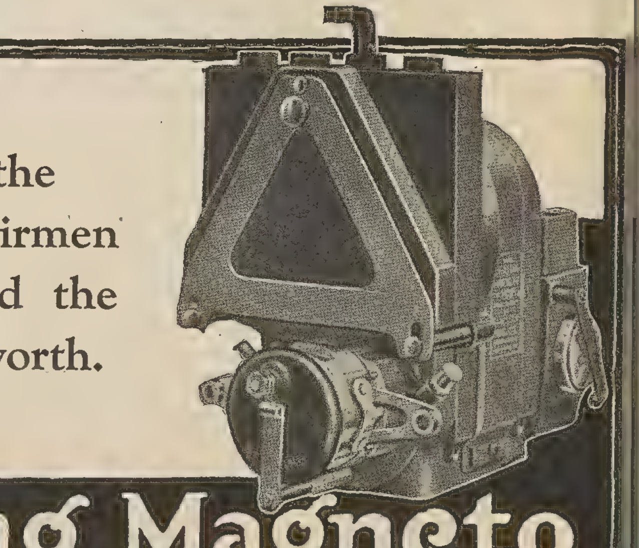
Half of the American airmen have proved the Berling's worth.



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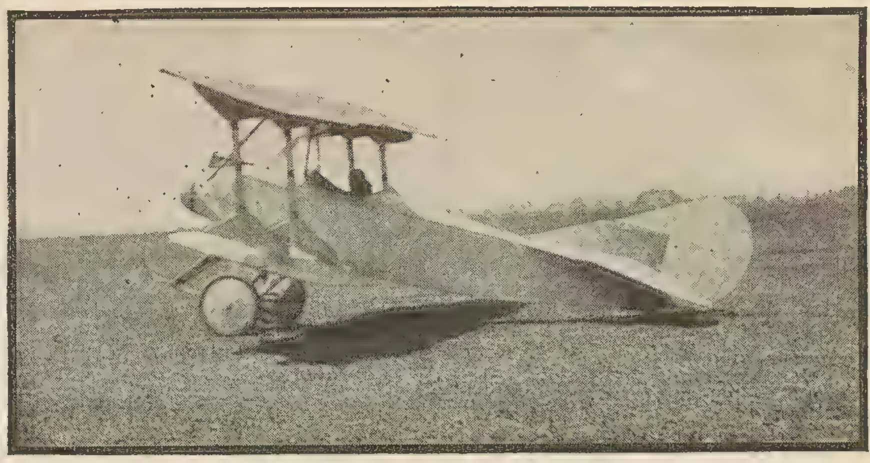

About to Take Off—Lieut. Murchie, Pilot

THE ACE

A light, reliable ship for the man who wants to fly regularly, and at a minimum of expense—America's first after-the-war airplane designed essentially for civilian use.

Specially recommended for ex-army and navy pilots, ranchmen and mining engineers who have had flying experience, and excellent for country clubs and cities desiring aerial police protection.

Price $2500

New illustrated folder, giving specifications and many photographs, will be mailed on request.

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Sales Offices: 220 West 42nd St., New York
Telephone 7067 Bryant   Flying Field, Central Park, L. I.

Thomas

THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
ITHACA, N.Y. U.S.A.

NC Fliers Warmly Greeted at Home

(*Continued from page* 3)

the sentiment. Her excitement was qualified, however, by doubt that Lieutenant Breese was aboard the Zeppelin, it having been reported that he missed the ship.

It was not until the big transport had drawn fairly close that her fears were settled. From the decks, alive with men, the sharp eyes of the woman presently picked out a little line along the port rail of the quarter-deck, which proved to be the long-awaited party.

Other welcoming vessels had joined the convoy. The Dock Commissioner's tugboat, Manhattan, had been procured for the occasion by the Aero Club of America, which took down a committee to greet the fliers. The Mayor's Committee of Welcome boat, Patrol, was crowded to the guards as it circled the big transport. Its band was answered by the band aboard the Zeppelin, and the whirr of flying-boat motors overhead, the roar of steamboat whistles and the cheers of returning doughboys made spoken interchange between the flyers and their wives out of the question.

After circling the Zeppelin twice as closely as caution permitted, the Herreshoff put in at Hoboken, where the ladies were escorted to an office to pass the tedious minutes until they could greet their husbands.

The flying boat patrol from Rockaway was augmented in the harbor by a flight of five airplanes from the Mineola flying fields. They consisted of two De Haviland and three Curtiss training planes. Twelve would have been sent out had the weather permitted. One De Haviland, piloted by Lieut. Ross C. Kirkpatrick, carried invitations from the American Flying Club to the dinner at the Hotel Commodore.

Byrd's Sextant

Commander Read was willing enough to talk of navigation problems met and conquered, but he declined to say whether he had used the Byrd sextant, invented by Lieut. Commander R. E. Byrd, who mapped out the trip. This will be held for his report, and the facts he gives will be awaited with interest by airmen.

"I will say that at a dinner given the NC men in London by Commander Towers a cablegram congratulating Commander Byrd was sent," he said.

Commander Towers's remark concerning the failure of the radio compass, or direction finder—something new to aerial navigation—was the result of a statement made by Commander Read, who had been asked earlier how he happened to reach the Island of Flores under the same atmospheric conditions experienced by the pilots of the other planes.

"I call it just good luck," he said. "I got through the fog bank and caught one glimpse of land. Of course, I knew what the land was and headed for it. I never have been able to understand why the others had worse weather. One was to the north of me and the other to the south of me. Reports received by wireless indicated that the fog was less dense to the south. I was in the centre of the sandwich, so to speak."

"That is perfectly true," said Commander Towers in discussing this point. "Both Read and I were south of the course, which lay between the Islands of Corvo and Flores. When I was off Flores I too got one flash of the sun and made an observation, but I didn't trust it. Later, I wished I had as it would have saved us fifty-six hours in the water.

"It was about that time that the engineer informed me we had but two hours of gasoline and I decided to descend to the sea."

"Then you were not forced down by the storm or fog?" he was asked.

Radio Compass Failed

"Not at all," replied the commander after a slight pause. "The plane—all of them, in fact—could have withstood the storm and fog nicely. We came down because we didn't know where we were, and could not afford to take chances with so limited a supply of gas."

"But you were supposed to know by means of your radio compass?"

The commander paused for a considerable time.

"I'll be perfectly frank with you," he said finally. "That was the whole trouble—not the fog and unexpected storm. But I want to say right here that the most valuable result of the flight, scientifically speaking, was the demonstration that the radio compass is most remarkable. It will make air travel over the ocean feasible.

"The difficulty did not lie in the fact that the compass was imperfect, but in the fact that under the system of installation on the planes it was confined to a radius of ten miles. With proper installation it would have recorded signals sent from a distance of 150 miles. We knew the limitations before we got to Halifax. We also were aware that it would require at least a week to make the necessary changes."

Lieut. Commander Read and Mrs. Read left New York for Washington at 1 o'clock last Sunday. Commanders Towers and Lieut. Commander Bellinger, with Mrs. Towers and Mrs. Bellinger, took a later train to the capital. The officers reported to the Navy Department at 10 o'clock Monday morning and returning to New York on Wednesday for the dinner to be given in their honor at the Hotel Commodore, by the American Flying Club.

The reason why Commander and Mrs. Read left earlier than the other Captains of the transatlantic flying boats was that the six-months-old Read baby has not seen its father for two months, and Mrs. Read thought it a bit neglected.

Brig. Gen. Mitchell of the Air Service has wired that he and his staff would be present at the American Flying Club dinner which will be fully reported in the next issue of AIRCRAFT JOURNAL.

At this dinner, which will really mark the official welcome home of the fliers, most of the important officers of the Air Service will be present.

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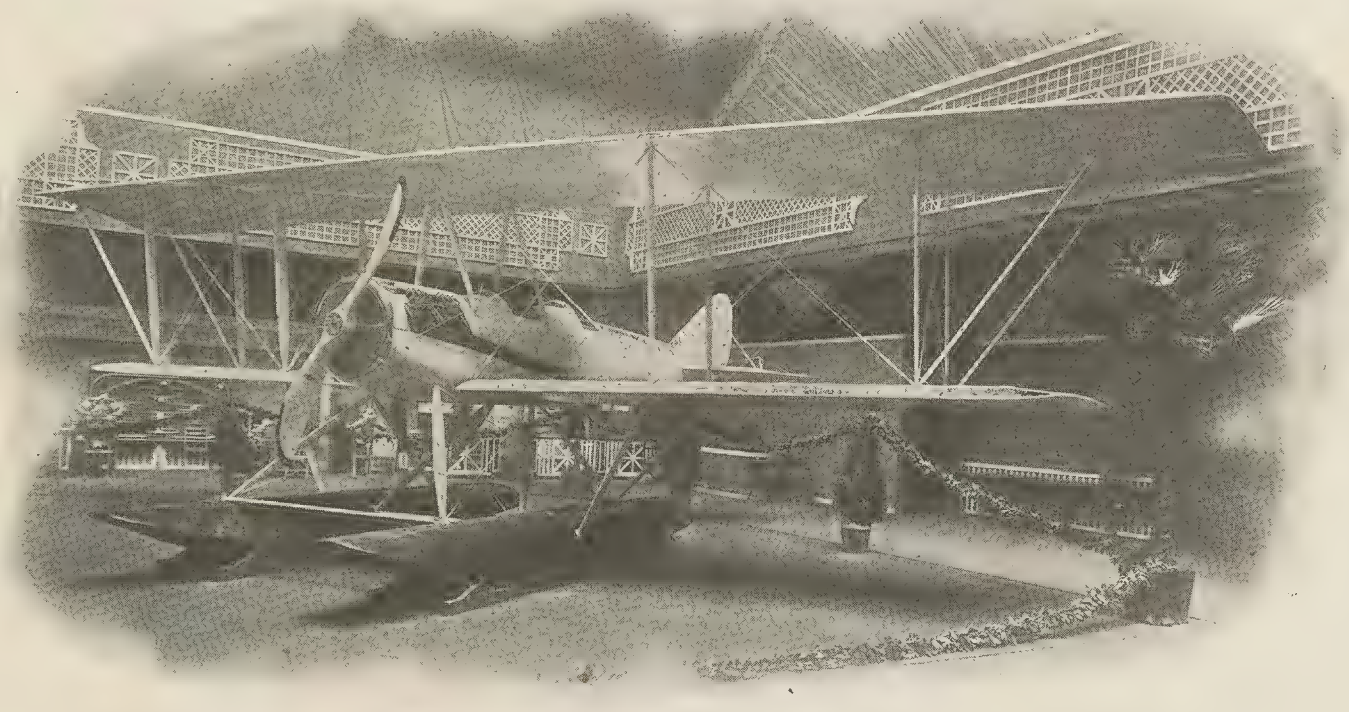

"THE SEAGULL"—Sport Seaplane

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World's Airplanes and Seaplanes

(Continued from page 6)

constructed of four longerons, braced by veneer cross panels, and is covered with 3-ply veneer. The fin is of simple construction, and is covered with 3-ply, while the other tail surfaces are covered with fabric. The rudder and elevator are balanced, and the spars of these parts are of a very deep box section. The ribs in the tail surfaces are not routed. An aluminum trailing edge is used on the wings, ailerons, rudder and elevators. The stabilizer is fixed at a non-lifting angle, and attached to the upper longerons. The tail skid is spring steel.

The radiator is installed in the center section of the upper plane, and its location has necessitated some slight modifications in the engine to increase the water circulation. The propeller diameter is 9 ft. 4 in. The center of gravity of the fuselage occurs at a point 6 ft. 3 in. from the nose of the fuselage.

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287	Tony Barone	Fort Worth, Texas
388	H. W. Hanchette	Fort Worth, Texas
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492	Luke Christopher	Everman, Texas
463	Francis B. Towle	Larchmont, N. Y.
465	Howard J. Ludington	Holley, N. Y.
474	Charters Ward Birch	Albany, N. Y.
485	Edward P. Brennan	Southampton, N. Y.
488	Lyman B. Lockwood	New York City
489	L. Phelps Ashley	Norwood, N. Y.
490	Mark I. Ashley	Norwood, N. Y.
464	Donald Gifford Vande Water	Washington, D. C.
472	Henry C. Kenly	Washington, D. C.
473	William L. Kenly	Washington, D. C.
466	G. W. Shaw	Caribon, Maine
467	Laurence L. Russell	Wilmington, Del.
468	Adolphua R. McConnell	Knoxville, Tenn.
469	Earl Kenneth Campbell	Strawberry Pt., Iowa
470	F. E. Carter	Chevy Chase, Md.
481	Charles Fred Taylor	Waterloo, Iowa
487	George L. Barnett	Des Moines, Iowa
478	E. A. Johnson	Dayton, Ohio
482	R. D. Jennings	Ravenna, Ohio
475	Paul B. King	Salt Lake City, Utah
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506	Paul Augustine Bogan	44 Guild St., Boston, Mass.
507	Caspar D. Swinson	80 Alfred St., Detroit, Mich.
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518	S. C. Wilberg	595 Charles River Rd., Cambridge, Mass.
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534	Lyman A. Hodgdon	8 Indiana Ave., Somerville, Mass.
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559	Wade Stevens	Beaver City, Nebr.
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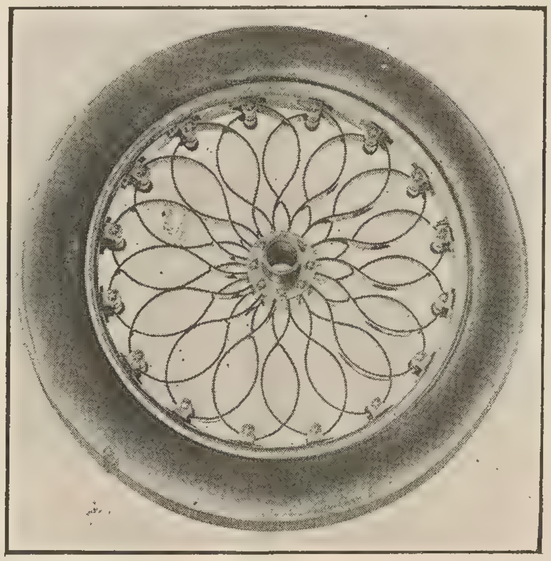

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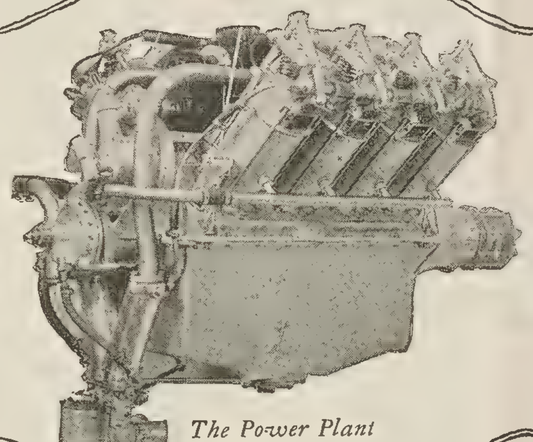

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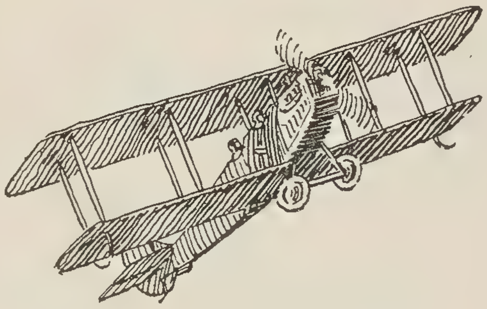

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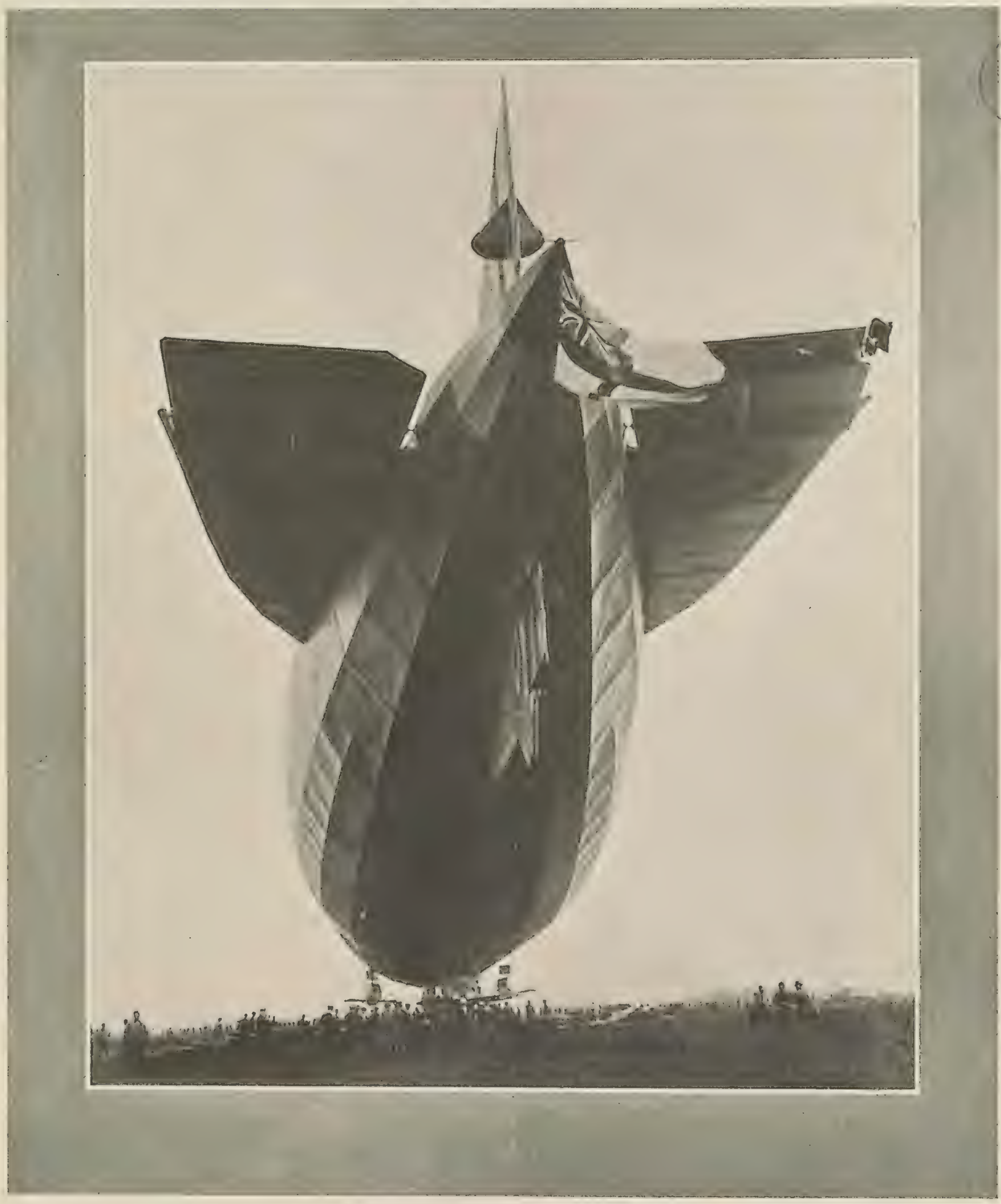

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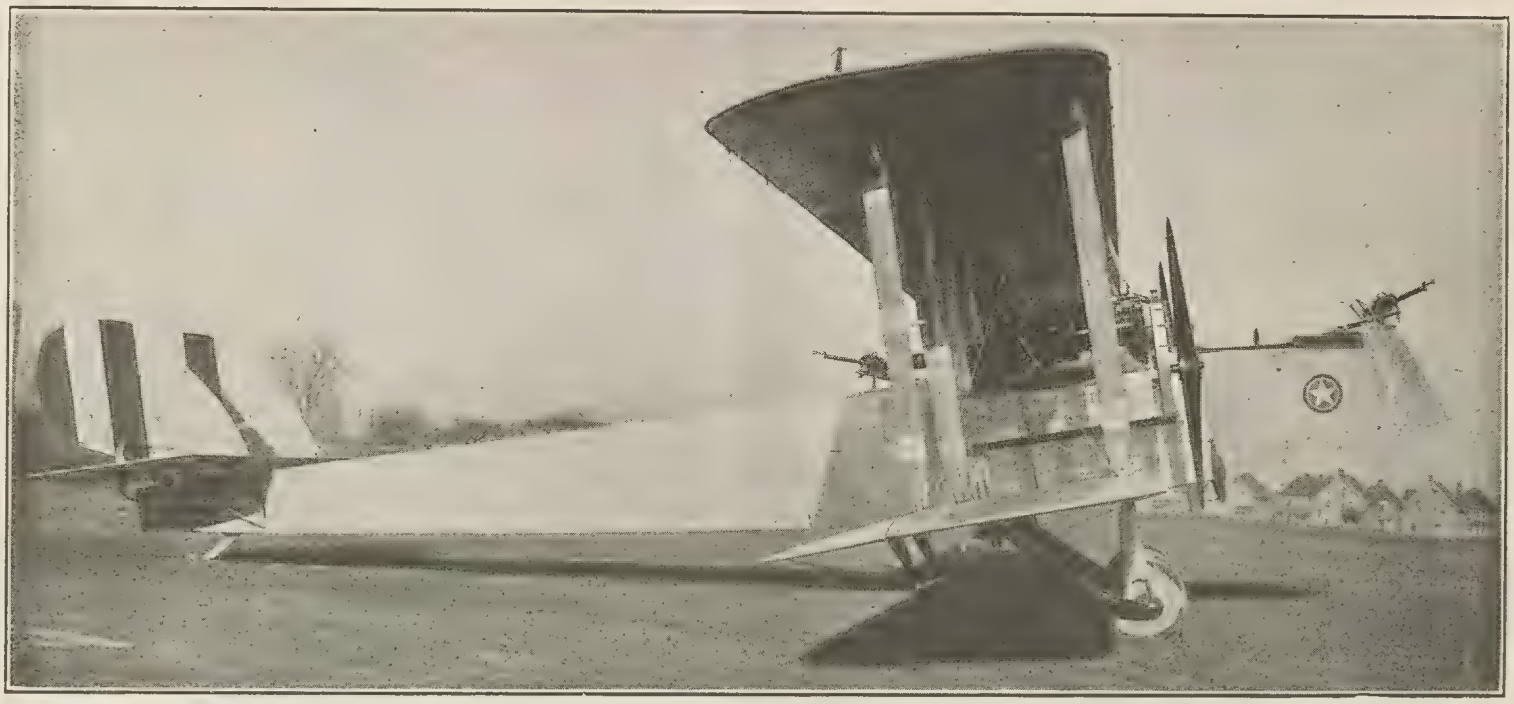
Striking View of the British Airship R-34 as She Landed at Roosevelt Field, Mineola, L. I., July 6—The Picture Shows a Close-up of the Stern



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R-34 Flies from Scotland to Long Island

Lack of Housing Facilities Makes Her Early Return to Great Britain Imperative

The British airship R-34 arrived at Roosevelt Field, Mineola, L. I., from East Fortune, Scotland, at 8:45 o'clock Sunday morning, July 6, circled the field three times to make observations, and at 9:21 o'clock the first overseas air pilgrim Major John Edward Maddock Pritchard, landed upon American soil, after a parachute drop of 2,000 feet.

This completed the longest flight in history, the distance covered being 3,200 miles, not counting the mileage forced upon the fliers by adverse winds. The time consumed was 108 hours and 12 minutes. The big airship brought over thirty-one persons, one of whom was a stowaway, and a tortoise shell cat.

During the morning of July 7 the straining of the aircraft against the cables with which she was leashed tore a rent four feet square in the covering of the bag, but this was soon repaired.

The engines had not been wholly overhauled until the afternoon of the next day, therefore the big airship did not start on the return trip on July 8, and was not expected to leave before the last of this week.

Letters and platinum were brought over by the R-34, and mail was carried on the return trip.

A fortunate turn of the wind at about 2 o'clock Sunday morning made the success of the flight possible. Four times on Friday night and early Saturday morning heavy squalls and thunderstorms had threatened to cripple or smash the flying colossus. Taking these experiences as mere matters of course, Major G. H. Scott, the commander, decided at the first sign of favorable weather to attempt to complete the trip as contemplated in the beginning, by landing at the original objective point, although it involved careful calculation of mileage to be covered against the scant stock of gasoline remaining.

Tossed Like a Dory in Storm

During the worst of the storm on Friday night the big airship was suddenly tossed aloft 500 feet and pitched about like a dory in a heavy sea. For a time there was great danger that a vital part would be smashed and a landing forced on the rough water, but the workmanship and material in every part of the 650-foot air giant proved flawless and Commander Scott got his craft safely through. His officers and men were at a loss to find words to tell their admiration for his navigating and for the staunch flying airship itself.

At 8:35 o'clock the R-34 became visible from Mineola Field, looking at first like a splinter split off from the bluish horizon in the northeast. A thin line of light beneath it made it distinguishable at first at a distance of about twenty miles. Slowly it disengaged itself from the blurring lines where the earth and sky met, and gradually its bulk began to develop. As it approached the field it rose for better observation, and at about 9 o'clock stood out in the sky in its full superdreadnought proportions, its painted skin responding to the sun, which had become bright a few minutes before, and giving off a dull metallic gleam between lead and aluminum in tint.

It glided through the air with such smoothness as to give the suggestion that it was motionless and the spectator moving. Like the buzz of a midsummer noontime, the hum of the motors produced no disturbing effect on the quiet.

The ship approached the landing place at a height of about 2,000 feet, coming from the east northeast and passing over Mitchel Field. It swung around the outskirts of Roosevelt Field, while the commanders studied the details of the landing place. The manoeuvres for observation took the airship three times around the field before she came to a stop. At 9:11 it shut off its motors, and hovered, like a fixed object, 2,000 feet above the ground.

(c) Keystone View Co.

Crew of the R-34. Left to right—Lieut. Commander Z. Lansdowne, U. S. N.; Second Lieut. Rex Durrant, wireless officer; Lieut. Guy N. Harris, meteorological expert; Major J. E. M. Pritchard, Air Ministry; Brig.-Gen. E. M. Maitland, C. M. G., D. S. O., representing Air Ministry; Second Lieut. H. F. Luck and Second Lieut. John D. Shotter, engineer officer—all British R. A. F.

First Man to Land

Wig-wag communication was opened between the dirigible and the field, and Major Scott was informed that Major Fuller, who was to have been in command of the landing, was not there, having started for Boston when the R-34 purposed landing there. Major Pritchard, the second officer on the dirigible was then directed to land and take charge of the ground work when the dirigible descended. At 2,000 feet Major Pritchard jumped with a parachute, swinging around and around in circles and moving slowly downward. His descent occupied two minutes and he landed rather heavily at 9:19, slightly injuring his hip. Under his directions 600 workmen were disposed in eight groups to tie down the great gas envelope which, though sure and steady in the air, is inclined to be erratic when chained to an alien element.

After these forces had been deployed in precise order the dirigible began to release gas and descend. It moved down on an even keel, as if it were a great weight being lowered by an invisible crane. It kept precisely over its anchorage with an accuracy of navigation that would have been the despair of any deep water skipper proud of his skill in docking his ship. She gained a little speed as she sank down the last 1,000 feet, and when about 300 feet up she suddenly released a great flood of water ballast, which spread into a sheet and then poured in a torrent to the ground, showering the workmen under it. This water was dropped from canvas tanks in the hull to steady and delay her descent.

The landing of a big airship is a very delicate operation. It requires nice balancing by the skipper in releasing water and gas in the last few feet of the approach to the ground in order to bring a state of equilibrium as the machine touches the earth, thus preventing a jar which might disjoint the light skeleton on which the outer cover is stretched.

As it was making the final descent, the main mooring line was tossed to workmen waiting to receive it and it was thrust through a massive iron ring, with concrete anchorage, which bridles the big machine until it has been securely fixed by eight anchors.

The line, which is about six inches thick, made a bullseye in its drop, falling squarely over the main anchor. The workmen, who rushed to catch it on the bound, were flung to the ground and rolled about, as if by the lash of a gigantic whip, but they subdued it in a second and rushed with it to the iron ring. An instant later it was dragged through this opening and the gas bag was secured. A few moments later the crews of men were pinning it down like Gulliver, attaching anchors all along the hull to prepared anchorages of concrete and steel, sunk deeply into the earth.

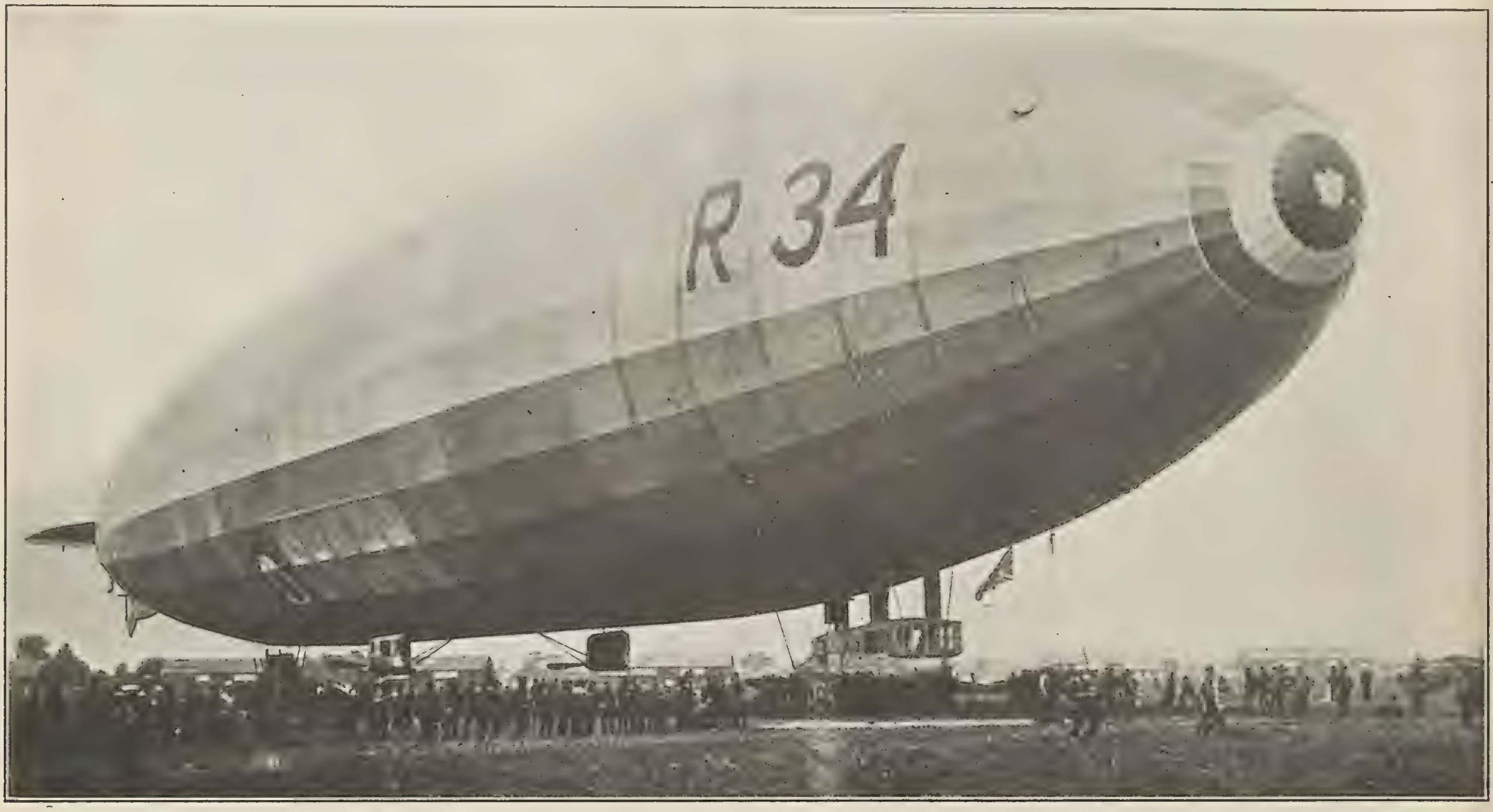
The British officers, accompanied by their American guest, Lieut. Commander Zachary Lansdowne, climbed out of the gondola to receive the official greetings of the Government of the United States and the hearty congratulations of brother seamen and fliers in American and British uniforms. Those who expected to find them worn and wan from their unparalleled experience were astonished to see them all in the finest fettle and spirits, ruddy and vigorous, wide-awake and full of fun.

The crew followed them to land, on which none had set foot for nearly five days, all the members being in good health and spirits, except one man, who had suffered a smashed thumb, the only accident of the criuse.

Stowaway the Crew Star

The star member of the party was the stowaway, William Ballantyne of Newcastle-on-Tyne, who registered a new adventure in the history of the human race by smuggling himself across the Atlantic Ocean in midair. This Ballantyne, who is 22 years old, is a rigger on dirigibles, had sailed with the R-34 in its sensational flight over Germany and the Baltic and would not be left out this time, when he was dropped from the roll of the crew because he was the thirtieth man and it was thought necessary to cut the crew to twenty-nine, to reduce weight and conserve fuel.

But the "rigger," while pretending to accept his fate with good grace, planned, with the probable connivance of some of his pals, to hide in the ship the day before she started. He climbed up from the gondola into the space between the outer skin of the airship and the bottom of the gas container. This is the space into which the crew climbs for sleep, exercise, and rest. It is rather dark there normally, and Ballantyne hid himself by climbing to the top of a beam which runs the length of this chamber. He took good care not to be put back, because he did not disclose his presence on board until the ship had been six hours in flight.



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Arrival of the R-34 at Roosevelt Field

Major Scott admitted that he had been informed of this man's disobedience of orders, when he discussed the voyage. "He probably had help from other members of the crew in stowing away," said Major Scott. "I don't doubt that. We felt that we had to cut the crew and so we left him off, but he would not have it."

"Will he be court-martialed or anything?"

"Possibly something of the kind," said the commander, with a smile. "Perhaps his punishment will not be very heavy."

Major Scott said, however, that the romantic stowaway had not been treated as a guest. "We worked him proper," he said. "In addition to that, he didn't have a hammock."

When he was asked how much fuel he had left when landing, Major Scott said:

"I don't know exactly, but I think about three hours."

Other officers of the R-34 thought that there was less than an hour's fuel and that it was touch and go in the last few minutes whether the flier could reach Mineola and make a landing under safe conditions. The commander of the dirigible was not inclined to talk, but at the Garden City Hotel he good naturedly answered questions, under constant interruptions from Congressmen and men escorting pretty women demanding to be introduced to him, and others who felt that the great air navigator should not be allowed to get away without meeting them.

"We often flew as low as 400 feet from the ocean in the course of the voyage," he said. "When the wind was high we flew low, and when the wind was low we flew high. We didn't get very good treatment from the wind."

Officially Welcomed

The officers of the R-34 were officially welcomed at a lunch given in the Garden City Hotel. Vice Admiral Gleaves, who presided, in a greatly applauded speech, congratulated the officers over the successful flight of the dirigible and welcomed them to this country in the name of Secretary Daniels and both branches of the service.

Vice Admiral Gleaves introduced General Maitland, who said:

"I want to express my sincerest thankfulness and appreciation for the kind words spoken in behalf of Major Scott, the other members of the R-34 and myself. I am not going to tell you of our trip. Major Scott is here to do that, but I would like to mention two experiences. We set out to cross the Atlantic, and we hardly saw it. We hugged the clouds all the way across. At times the clouds were over and under us, and at one time I began to wonder if we would ever see it. I was surprised at the absence of motion. I am a bad sailor, and susceptible to seasickness. It did not bother me. I believe that in the days when we will be crossing by air these airships will be sought after by persons subject to seasickness.

"The Air Ministry had a definite object in sending us out, to fly from east to west and back. It was to demonstrate what airships will ultimately do to establish commercial service. This not only between England and America, but all around the world. I believe that within a few years there will be regular commercial service.

"This will not be with ships of which our own is a grand pioneer. She is not big enough for the job, and we had anxious times owing to petrol, but with ships bigger and speedier we will have no trouble—airships five times larger than our own. I venture to hope that in the future these ships will have a hundred miles an hour and have two hundred tons lifting capacity and will carry passengers, mail, and fuel. When they do they will play a big commercial part between the two countries."

General Maitland spoke of the appreciation felt by the men for the cordial way in which they had been received.

Vice Admiral Gleaves, in introducing Major Scott, spoke of the possibilities of the airship, and he said that Admiral Beatty had been quoted as saying that the airship of the future will take the place of the cruiser. He reported having heard that the Admiral said he would rather have one airship than six cruisers.

Major Scott said the main fact was that "we left England with the intention of crossing, and we got here."

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"We had the wind against us nearly all the way," continued Major Scott. "The wind was favorable at the start and again at the finish. That we could come across at such odds speaks well for the future. There is one thing that I want to say now, and that is that the arrangements for landing here were absolutely wonderful. I don't think we could have landed in England and found any better arrangements."

Major Scott said rather humorously that he knew the arrival of the R-34 had occasioned some trouble and he said he wanted to apologize to the Navy for the request for help and the trouble that had been caused. Things would have gone well had the big dirigible not met head winds, for, as it was, he said, he had just enough petrol to come through. He thanked the American Navy for the positions given, the weather reports, and the hearty co-operation.

In speaking as the representative of the army, General Charles T. Menoher, Director of Army Aviation, began by pointing out that perhaps few knew that the reason for the efficient work in landing the dirigible was because many of the men who carried out that task had been trained in England.

"I look for greater development in lighter than air rather than heavier than air craft," he said. "I believe it is almost a matter of a few years when we will have ships five times larger and of greater capacity than that which arrived today. If they can carry 200 tons deadweight they can carry a battalion armed and equipped."

Great care was taken to guard the R-34 while she was at Mineola. Details of several thousand doughboys were assigned to the work and they were cheered along by the Knights of Columbus at their rest hut near the field. Supervisor James Cunnion was in charge of the hut, aided by Thomas Cullen, General Secretary and several assistants from the Garden City Hostess House.

Log of the R-34

Brig. Gen. Edward M. Maitland, C. N. G., D. S. O., official observer for the British Air Ministry, on board the R-34, made public yesterday his official log of the first flight from the time the dirigible left East Fortune, Scotland, until it arrived at Mineola. The log follows:

Distances covered were as follows: East Fortune to Trinity Bay, Newfoundland, 2,050 sea miles; Trinity Bay, Newfoundland, to New York, 1,080 sea miles.

It was originally intended that this flight should have taken place at the beginning of June, but owing to the uncertainty of the Germans signing the peace terms the British Admiralty decided to detain her for an extended cruise up the Baltic and along the German coast line. This flight occupied fifty-six hours under adverse weather conditions, during which time an air distance of, roughly, 2,400 miles was covered.

At the conclusion of this flight the ship was taken over from the Admiralty by the Air Ministry and the airship was quickly overhauled for the journey to the United States of America.

The date and time of sailing decided upon was 2 A. M. on the morning of Wednesday, July 2, and the press representatives were notified by the Air Ministry to be at East Fortune the day previously.

The Start

At 1.30 A. M. on the morning of Wednesday, July 2, the airship was taken out from her shed and actually took the air twelve minutes later, thus starting on her long voyage exactly eighteen minutes in advance of scheduled time.

The story of the flight as entered in the log follows:

1.42 A. M., Wednesday, July 2:

The R-34 slowly arose from the hands of the landing party and was completely swallowed up in the low-lying clouds at a height of 100 feet. When flying at night, possibly on account of the darkness, there is always a feeling of loneliness immediately after leaving the ground. The loneliness on this occasion was accentuated by the faint cheers of the landing party coming upward through the mist long after all signs of the earth had disappeared.

The airship rose rapidly 1,500 feet, at which height she emerged from the low-lying clouds and headed straight up the Firth of Forth toward Edinburgh.

A few minutes after 2 o'clock the lights of Rosyth showed up through a break in the clouds, thus proving brilliantly that the correct allowance had been made for the force and direction of the wind, which was 20 miles per hour from the east.

It should be borne in mind that when an airship sets out on a long distance voyage carrying her maximum allowance of petrol she can only rise to a limited height at the outset without throwing some of it overboard as ballast and that as the airship proceeds on her voyage she can, if so desired, gradually increase her height as the petrol is consumed by the engine.

An airship of this type when most of her petrol is consumed can rise to a height of about 14,000 feet.

For this reason the next few hours were one of the most anxious periods during the flight, for Major Scott, the captain of the airship, who, owing to the large amount of petrol carried (4,900 gallons, weighing 15.8 tons), had to keep the ship as low as possible and at the same time pass over Northern Scotland, where the hills rise to a height of over 3,000 feet.

Owing to the stormy nature of the morning the air at 1,500 feet—the height at which the airship was traveling—was most disturbed and "bumpy," due to the wind being broken up by the mountains to the north, causing violent wind currents and "air pockets."

Col. Wm. N. Hensley, A. S. A., who replaces Lieut. Commander Lansdowne as observer on the return trip of the R-34

The most disturbed conditions were met in the mouth of the Clyde, south of Loch Lomond, which, surrounded by high mountains, looked particularly beautiful in the gray dawn light.

Ireland Sighted

The islands at the mouth of the Firth of Clyde were quickly passed. The north coast of Ireland appeared for a time and shortly afterward faded away as we headed out into the Atlantic.

The various incidents of the voyage are set down quite simply as they occurred and more or less in the form of a diary. No attempt has been made to write them as a connected story. It is felt that, by recording such incidents in this way, most of them trivial, a few of vital importance, a truer picture of the voyage will be obtained.

Time, 6 A. M., July 2:

Airship running on four engines with 1,600 revolutions. Forward engine being given a rest. Air speed thirty-eight knots—land miles per hour made good 56.7. Course steered 298 degrees—north, 62 degrees west, course made good 39 degrees, north 71 west. Wind northeast, 15 1/3 miles per hour. Height 1,500 feet.

Large banks of fleecy clouds came rolling along from the Atlantic, gradually blotting out all view of the sea. At first we were above these clouds, but gradually they rose higher and we plowed our way into the middle of them.

7 A. M.:

Nothing but dense fog estimated by Harris, the meteorological officer, to go down to within fifty feet of the water and up to a height of about 5,000 feet.

Suddenly we catch a glimpse of the sea through a hole in the clouds and it is now easy to see we have a slight rift to the south which was estimated by both Scott, the captain, and Cooke, the navigating officer.

A few minutes later we find ourselves above the clouds, our height still being 1,500 feet, and beneath a cloudy sky with clouds at about 8,000 feet. We are therefore in between two layers of clouds, a condition which Alcock and Brown found themselves on more than one occasion on their recent flight from west to east.

An excellent cloud horizon now presents itself on all sides, of which Cooke at once takes advantage. These observations, if the cloud horizon is quite flat, ought to prove a valuable rough guide, but cannot be regarded as accurate unless one can also obtain a cheeck on the sun by day or the moon and stars by night.

Cooke reckons it is easy to make as much as a fifty-mile arc in locating one's position when using a cloud horizon as substitute for a sea horizon.

7.30 A. M.:

Breakfast in crew space, up in the keel, consisted of cold ham, one hard boiled egg each, bread and butter and hot tea. We breakfast in two watches, generally about fifteen in each.

The first watch for breakfast was Scott, Cooke, Pritchard, Admiralty airship expert; Landsdowne, Lieutenant Commander United States Airship Service; Shotter, engineer officer; Harris, meteorological officer; myself and half the crew.

Conversation during breakfast reverted to recent flight up the Baltic; and in the adjoining compartment the graphophone was entertaining the crew to the latest jazz tunes, such as "The Wild, Wild Women."

It might be interesting at this stage to give a complete list of the crew, showing their various duties:

Officers

SHIP'S OFFICERS

Major G. H. Scott, A. T. C., captain.
Capt. G. S. Greenland, first officer.
Second Lieut. H. F. Luck, second officer.
Second Lieut. J. D. Shotter, engineer officer.
Also:
Brig. Gen. E. M. Maitland, C. M. G., D. S. O., representing Air Ministry.
Major J. E. M. Pritchard (Air Ministry).
Lieut. Commander Z. Lansdowne, O. B. E., U. S. Naval Airship Service.
Major G. G. H. Cooke, D. S. C., navigating officer.
Lieut. Guy Harris, meteorological officer.
Second Lieut. R. D. Durrant, wireless officer.
W. O. W. R. Mayes, coxswain.

Warrant Officers and Men

ENGINEERS

Flight Sergt. Gent.
Flight Sergt. Scull.
Flight Sergt. Riplee.
Sergt. Evenden.
Sergt. Thirwall.
Corpl. Cross.
Lg. Air Craftsman Graham.
Corpl. Gray.
Air Craftsman Parker.
Air Craftsman Northeast.
L. A. C. Mort.

RIGGERS

Flight Sergt. Robinson.
Sergt. Watson.
Corpl. Burgess.
Corpl. Smith.
L. A. C. Forteath.
L. A. C. Browdie.

WIRELESS TELEGRAPH OPERATORS

Corpl. Powell.
A. C. Edwards.

Sea Hidden by Clouds

11 A. M.:

Still ploughing our way through the fog at 1,300 feet. Sea completely hidden by clouds and no visibility whatsoever. Stopped forward and two aft engines and now running on only the two wing engines at 1,600 revolutions. These are giving us an air speed of 30 knots or 33.6 miles an hour. This is the airship's most efficient speed, as she only consumes on the two engines 25 gallons of petrol an hour.

Wind is east seven miles an hour, and so we are making good 40 miles an hour and resting three engines.

Cooke is now on top of the airship, taking observations of the sun, using the cloud horizon with a sextant. The sun is visible to him but not to us, the top of the ship being 85 feet above us down here in the fore central cabin.

Our position is reckoned to be latitude 55 degrees 10 minutes north and longitude 14 degrees 40 minutes west, which is equivalent to 400 miles from our starting point at East Fortune and 200 miles out in the Atlantic from the northwest coast of Ireland.

We are in wireless touch with East Fortune, Clifden, the west coast of Ireland, and Ponta Delgada, Azores, and messages wishing us good luck are received from Air Ministry, H. M. S. Queen Elizabeth and others.

11.45 A. M.:

Lunch—Excellent beef stew and potatoes, chocolate and cold water.

The talk as usual was mainly "shop," dealing with such problems as the distribution of air pressure on the western side of the Atlantic, what winds were likely to be met with, what fog we should run into, the advantages of directional wireless for navigational purposes, cloud horizons and the like.

Scott, Cooke and Harris, in comparing their experiences and expounding their theories, were most interesting and illuminating.

12 noon:

Watch off duty turned in for their routine four hours' sleep before coming on for their next period of duty—only two hours in this case, as it is the first of the two dog watches.

(*Continued on page* 14)

American Flying Club Dinner to the NC Heroes

Brilliant Assemblage at Hotel Commodore Does Honor to the Trans-Atlantic Air Pioneers

(Double Page Picture of the Dinner on Pages 10 and 11 of This Issue)

The men who blazed the trail through the air across the Atlantic, Lieutenant Commander Albert C. Read and the crew of the NC-4, and the men who failed honorably while trying their utmost, Commander John H. Towers and Lieutenant Commander P. N. L. Bellinger and their crews, were cheered by a notable gathering of Army and Navy officers and men prominent in the world of aviation at a dinner given by the American Flying Club at the Commodore Hotel July 2.

At the Speakers' Table

The president of the club, Laurence La Tourette Driggs, presided and Job E. Hedges acted as toastmaster. Others at the speakers' table were:

Captain Roy N. Francis, U. S. A., Representative F. H. La Guardia, Colonel William A. Bishop, Commander G. C. Westervelt, U. S. N., Glenn H. Curtiss, Commander H. C. Richardson, U. S. N., Major-General Charles T. Menoher, U. S. A., Captain T. T. Craven, U. S. N., Commander John H. Towers, U. S. N., Lieut-Commander Albert C. Read, U. S. N., Rear Admiral James Glennon, U. S. N., Lieut.-Commander P. N. L. Bellinger, U. S. N., Brigadier General L. E. O. Charlton, R. A. F., Senator Harry S. New, Colonel Archie Miller, U. S. A., Commander J. C. Hunsaker, U. S. N., Colonel Thomas DeWitt Milling, U. S. A., and Captain Edward Rickenbacher.

President Driggs

President Driggs: Ladies and Gentlemen—Among the numerous telegrams which came to the club today I wish to read but three. This telegram is from the Secretary of the Navy:

"The success of the NC-4 in laying an air route across the Atlantic Ocean called for the plaudits of the world. The fleet added a branch to the Navy's laurel crown for pioneer work in a new field. I regret that I am unable to attend the dinner in honor of the crew of our NC boats tonight to express in person for myself and the Naval Service my appreciation of their intrepidity, zeal and perseverance in making their splendid record for the Navy and for American aviation.

(Signed) "JOSEPHUS DANIELS."

The following telegram is from the Secretary of War:

"Let me convey again through you the pride which all of us as citizens and officials of the government feel in the thrilling accomplishment of Commanders Towers and Read and their associates. Their action has written into our history a new page and for years we shall be stirred and quickened by the recounting of their pioneering adventure.

(Signed) "NEWTON D. BAKER,
"Secretary of War."

Among all these gentlemen who had so much to do with the winning of this race for America, most of whom you see before you at the speakers' table, there is one I am sure that all will agree was the pioneer of this success and I have from him the following telegram:

"I regret I cannot be with you this evening to honor Commanders Tower and Read who, by being first in crossing the Atlantic by airplane, have brought great credit to America. Please extend to them an appreciation of my felicitation and esteem.

(Signed) "ORVILLE WRIGHT."

As President of the club I desire to say for the club that we are under obligation to one of the best loved men in America, who has consented to act as toastmaster for us tonight. The club is but a few months old. The summer time coming at the same time the NC commanders and crews came back to New York it was with great difficulty that a dinner of this size was handled with the machinery that the club possesses. We must offer you our apologies for the many inconveniences that you have suffered. I hope that you will pardon them and I hope that the man I refer to as one of the best loved in America will do the best for the club. I beg to introduce Mr. Job Hedges, the Toastmaster. (Applause.)

Toastmaster Hedges

Toastmaster Hedges: Mr. President, distinguished guests, ladies and gentlemen,—and particularly those ladies who are the real commanders of these alleged commanders up here. (Laughter and applause): You will pardon me, Mr. President, for expressing a feeling of satifaction about that best beloved business. I don't know whether it is true or not, but I hope it is, although there have been occasions in my brief career when it hasn't been borne out.

We Navy men (laughter) welcome you here. As toastmaster, I flirted a little bit with the committee indicating that I didn't know at first whether I could do it or not, but I intended to accept all the time. I have always wanted to be connected with a historical event. This dinner furnishes one of those situations. It is a great pleasure also to be toastmaster at the first thoroughly dry dinner of any size given in New York. Hereafter we will have to say to each other that we can drink to each other only with our eyes.

I want to say to these distinguished gentlemen that while they have been welcomed by the President and members of the cabinet, it remains for me to welcome them on behalf of various functionaries and on behalf of the government of the State of New York. On behalf of the Mayor and the Board of Aldermen; as receiver of the New York Street Railways; as a former candidate for governor; as a member of the Princeton Club and of the University Club; as an enrolled member of the Tenth Assembly District Organization, as an annual $10.00 subscriber to the Metropolitan Museum of Art, and in various capacities too numerous to mention, I extend to these gentlemen a very hearty welcome. We are glad that they are here and we are glad they got back.

(c) Underwood & Underwood.

Commander Read and the members of the crew of the NC-4 received a great ovation on their arrival in London for their great achievement in accomplishing the first trans-Atlantic flight. The photo shows Commander Read being carried through the streets of London on the shoulders of the crowd.

I don't think of anything at the moment that can separate the British nation and the American nation. Certainly there is no ocean broad enough to keep them apart. There is no mountain high enough to screen them from each other. There is no fog dense enough that their mutual purposes cannot penetrate, and, all together, the English speaking people have come to stay, and to fraternize and to like each other. Now that we can fly through the air or go under the ocean or talk through the air we know each others' purposes and decent people don't have to get together so often to understand each others' ideas. I can't think of any organization that could keep them apart; I can't think of any disturber of general social conditions, and God knows the German nation couldn't do it. I have been thankful to the kaiser myself, for drawing decent people together. Now and then a non-intelligent mind does something intelligently inadvertently.

Lieutenant Commander Read and I have known each other for a long time spiritually. I know just how he feels now. He feels as I would feel if I were about to go up in an airplane. It just shows how different conditions can revise conditions.

Lieutenant Commander Read just started out and said: "I am going to get over there," and then he went over, not over the top, but over everything. And he has got a harder time before him during the next few months than he had in getting across the water. And so all I will say of Lieutenant Commander Read is that he suits me and I know he suits you and I know he suits the American people and I know he suits all other intelligent peoples, and he suits Mrs. Read. And so, in order not to prolong this I will just ask the Lieutenant Commander to hop off and tell us about it."

Lieutenant Commander Read

Lieutenant Commander A. C. Read: Ladies and Gentlemen—I can't tell you how much I appreciate the honor of being here tonight, and on top of that, the demonstration. When we were abroad, after we had made the flight, we visited quite a number of places on orders. We were dined and wined. Twelve countries decorated us. Everywhere we went there were crowds to meet us, including reporters and moving picture machines. We enjoyed it all very much: It was something new in our lives. But after all the thing that we really appreciate is what the people do at home; how they think. For that reason, when we say we appreciate it now, we mean it as we never meant it before.

Before coming in here I saw a card which said, 'Lieutenant Read would tell the story of his flight.' I have told it so many times that I thought everybody knew about it; but perhaps they do not know some of the results obtained by the flight. In the first place, I'd like to take this opportunity to congratulate all those who were responsible for the design and the excellent workmanship in the NC boats.

There is one thing we learned—there were a good many things we learned—one of them that we must have larger boats the next time. Then the Liberty motors. I had never had much experience with them. I neither had faith in them nor lacked faith. But my opinion of them stands very high today. (Applause.) And I venture to say that any of you, if you had gone through a long flight from Trepassey to the Azores and felt that comfortable feeling that I did on looking back and seeing six cylinders on each side of each motor—that is all there are—spouting out a flame with never a miss, I know that you would feel the same way.

In regard to this motor question, we have a lot ahead of us. It has been demonstrated that the geared motor is the thing for seaplanes particularly. For those who don't know what a geared motor is, I will tell them that it is merely a gearing down so that the propeller revolves at less revolutions than the motor; and that is just the thing we want, as, generally speaking, the motor is most efficient when it is going the fastest, and a propeller is most efficient when it is going slowly. And in that same connection, one of the future developments of importance, which Mr. Gallaudet has already shown us, is the hitching up of more than one motor to a single propeller.

Before I leave the subject of Liberty motors I want to extend my very best wishes to Captain Francis, who is going to use them on the transcontinental flight. And although I don't like to prophesy—aviation has not advanced far enough so that is safe—I believe that he will have as good or better chance with the Liberty than with any other. (Applause.)

Results from the Radio

Then there is one of the most interesting parts of the whole trip. That was the result obatined from the radio. I don't know whether I had a particularly good installation or whether I had a particularly good radio officer—I think, as a matter of fact, it was a combination of both. Ensign Rodd was the radio officer, but we got results that I know broke a great many records as far as seaplane communication goes. He sent messages over seven hundred miles. That doesn't sound much when you speak of Arlington, but when you speak of NC-4, it sounds pretty big.

He copied a message from the George Washington about to arrive in Brest, he copied it verbatim, a long message, 1175 miles away. He heard Boston 1,000 miles away. He heard other radio stations calling each other over 1,300 miles away. And then there was the radio compass. Preliminary results at Rockaway were unsatisfactory as far as I knew. I took out a plane one day and they were unsatisfactory that day. I didn't have much faith in it. In fact, I almost forgot it was on board, till we left Ponta Delgada, and got in trouble on account of my own carelessness.

We got off the course between 15 and 20 miles, perhaps 25. The visibility was much less than that and we missed our destroyers, and I called on the radio officer to see what he could do about it. I wasn't sure which side of the line we were on.

He came up with a bearing 20 degrees on the port-bow. I still was a "Doubting Thomas." I told him to get another one. About ten minutes later he reported the same destroyer 45 degrees on the port-bow. I changed the course and picked up the destroyer.

Later on, from Lisbon to Plymouth, it was very thick at times. I only sighted two out of the six destroyers, but each time we knew by the radio compass which side of the destroyers we were on.

I am firmly convinced that the future of trans-atlantic or trans-pacific, or Antartic navigation depends on the development of the radio compass. The rest of the instruments will be carried. There may be times of failure of the radio, but that will be the principal means of getting across the water.

Since landing on the other side, a great many people have asked questions of many different types and kinds. They asked how we ate, how we slept, whether we drank anything or not, were we comfortable, were we nervous, was it a great strain? It would take too long to answer all those questions, but there are one or two that I would like to answer. One of them—Was the trip worth while?

The principal reason for making the trip was to gain information about something we knew very little about, and which, looking into the future, was thought to be of very great importance. We obtained the information that we were after, regarding the structure of the machines, and the operation oversea.

Then there were the more intangible results that cannot be measured, of adding some prestige to the Navy and to the country and to bringing home to the great mass of people the fact that not only that it could be done, but that it had been done.

Another question was asked:

"What were your impressions of the trip?" I never knew how to answer that question. I have told you one impression I had during the night concerning the Liberty Motors. Another impression was the very small size of the Atlantic ocean. If one sits down with a pencil and paper and figures the time, the distance, the speed, you can arrive at certain results, but in order to realize it you have to do it. That was brought home to me particularly on the way home when it took ten days to get here. Then I began to think that may be the ocean was pretty big after all.

British Sportsmanship

One of the perhaps most important impressions of England was the sportsmanship of the British people. We had just captured the prize they had been hoping for. Perhaps here it might not be out of the way to say that Harry Hawker met me at the train, took the best care of me and although the papers have more or less gone after him on account of some remark that he made, this remark was very well explained to me, and I believe the explanation to the effect that he was endeavoring to defend the British Admiralty for not sending boats out. Some paper had criticised them quite severely. They said that the American Navy sent out boats all over the ocean, the British Admiralty did nothing. He was a guest at luncheon and he wished to defend the British Admiralty without thinking of the backfire which his words apparently created.

(C) *Press Illustrating Service.*

President Laurence La Tourette Driggs of the American Flying Club

In France I received a good many impressions. One of them, probably the chief one, was the great enthusiasm of the French for all things pertaining to flying. That same enthusiasm was apparent in England. They have a wonderful interest in the game. So when I got back I was rather surprised, in fact mildly astonished, to find an opposite attitude among the people in general in this country. I should not have been; I have lived here long enough, but it takes actual contact with other people to realize just the state of affairs. During the war there was plenty of enthusiasm here. There had to be. It was absolutely necessary that we get into it and get into it strong. But now that the war is over, there seems to be the same old question, the same old thing about the submarines. The first submarine made its plunge over on this side, the first plane flew on this side. There seems to be the attitude: "Well, there are great things ahead," but they want to let aviation take care of itself. Aviation is a thing that won't take care of itself. If aviation had the whole-hearted cooperation that it had during the war, which of course is impossible in peace times, but if it had that, I believe that within three years we would be sending our families across the ocean by air.

While in Paris I had the pleasure of lunching with some of the foremost designers of aircraft. If I mention some of the things that they said in a prophetic vein I doubt if there are very few here but would say that they are dreaming. Anyone, however, nowadays who says that it is impossible to reach an altitude of 60,000 feet, impossible to go to Europe in the forenoon and return in the afternoon, is very courageous with the courage that the old sailors had when they said that iron ships were impossible.

I am also a great believer in getting behind civil aviation. They say we need a merchant marine for the Navy. How much more do we need a merchant air force for the military and naval air force. A shipyard that is built for turning out freight carriers cannot be easily changed to a shipyard for turning out battle ships, but a factory that is built for turning out passenger carrying or mail carrying or cargo carrying airplanes can immediately turn to and turn out military airplanes of the latest type.

Why is it that the people won't get behind aviation? As far as I can make out it is ignorance. A great many people still stick to the old idea that flying consists of getting into a small, fast speed scout, and looping the loop and slipping and going through all sorts of stunts. They forget that the real flying game is the useful game, the useful part of it. They don't realize that there are great machines being built and greater ones to be built in the near future that can carry tons of bombs, guns or tons of passengers and freight.

So that the best thing, to my mind, that could be done for aviation is to start a campaign of education and when the people realize what there is in it, what there will be in it, they will get behind it as our friends the British have always been behind their Navy and made it what it is, and as they are now getting behind their air force.

Toastmaster Hedges: It is entirely logical that a gentleman should be called on now who comes from the other side, a Britisher. Some of us have not forgotten that that is the parent country. Some of us have not forgotten that they bore the original brunt in this war. Some of us have not forgotten, and I hope never will, no matter how much we aided, that there was a Flanders line before we got over. We aided, and I think I am not arrogating to myself an individual opinion when I say to the next gentleman, speaking on behalf of the American people, and addressing ourselves to the British people, that we owe them much, "within these walls of flesh there sits a soul, counts them her creditor, and with advantage intends to pay that love." General Charlton, the British Air Attache.

General Charlton

Brigadier General L. E. O. Charlton: Mr. Toastmaster and gentlemen: It is no good my telling you that this takes me by surprise. You wouldn't believe me. Those of us who have read assiduously the newspaper reports since the triumphant arrival of the NC crews at Plymouth, will realize that they have been feasted again, and I feel that I would not be out of place if I first of all offer congratulations to them on the robust appearance they present tonight, and their iron constitution.

To strike a new and original note on an occasion such as this, it were necessary to soar into the Empyrean, as they did, and I confess that oratorically speaking, it is a feat I am unable to accomplish. Nevertheless, honest and sincere congratulations, a theme that can never be outworn or threadbare, especially on an occasion of this kind, when the guests of honor tonight are those who have brought to a triumphant issue, a rare combination of organization, skill, science, and pluck—on behalf, then, of my fellow countrymen in the United States, be they officials or be they in a private capacity, I do offer my most heartfelt and sincere congratulations on this defeat of the Atlantic—a defeat which carries with it a sense of poetic retribution, poetic because it is right that the triumph should fall to America, who has conceived the science of flight and brought it forth; poetic because the voyage of Columbus, as he sailed from shore to shore, has been reversed in this case, and the joke is on him. Ever since man lived in a cave and chased mammoths for the sake of the marrow in their bones, he has waged an unceasing conflict with the elements of the earth—air, fire and water.

The gallant crews of the NC boats have taken not a step, but a complete stride toward the subjugation of the air. I only wish to add that it is a significant fact to which in my opinion sufficient attention has not been drawn, that in all the five attempts hitherto made, successfully, partially successful, and yet a failure, no loss of life has accrued. And I feel that

(*Continued on page* 9)

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Formerly Air Service Journal

Lessons of the R-34's Flight

THE 108-hour non-stop flight of the British airship R-34 from Scotland to Long Island is a pioneer performance whose value for the future of aeronautics it is difficult to overestimate.

The total distance covered from East Fortune air station to Roosevelt Field is, according to the official log given out by General Maitland, 3,130 sea miles, or 3,588 land miles. This is in itself a record for aircraft of any kind—one which has been surpassed but once; but the performance acquires a much greater significance when it is realized under what conditions the flight was accomplished.

After a brief period of favorable winds, storms and electric disturbances were encountered, which the most careful weather forecast could not always dodge, so that the R-34 had to ride out some storms of extreme intensity. That these atmospheric conditions put the vessel under very severe strains is obvious, and the fact that she succeeded in completing her journey without suffering any damage is therefore a high testimonial to the soundness of British rigid airship design as well as to the professional skill and devotion to duty of the Royal Air Force.

With respect to the latter it may be said that while on a rigid of this size a tolerable amount of comfort is provided for the officers and crew, the nerve strain involved in such a flight across uncharted skies is of the very highest order, the more so as in this case it extended over four days. Therefore every man of the complement, from Commander Scott down the hierarchic ladder, deserves the most sincere congratulations for the great feat each contributed to achieve in the portion allotted to him—even the stowaway, who had to " work his way across."

The lessons of this epoch-making flight, which constitutes at the same time the first transatlantic flight by lighter-than-air craft and the first aerial crossing from East to West are manifold.

Foremost perhaps the voyage of the R-34 spells the doom of America's splendid geographical isolation. The sea barrier of the Atlantic is no longer inviolable since an aircraft carrying thirty men succeeded in reaching these shores from Europe. What today seems but an experimental flight achieved in the face of great difficulties will in a brief time seem quite a common occurrence, that is, when regular airship mail and passenger services will be established across the Atlantic.

The warning is obvious. It is high time that the United States took a hand in the development of lighter-than-air craft of great size, and particularly of large rigid airships, we are so woefully in want of, and which in the war have proven such incomparable fleet scouts. If we do not now make good our backwardness in lighter-than-air equipment, the United States may in a future emergency find herself in the same deplorable situation as to up-to-date aircraft as in the spring of 1917, when the Nation's air force had to be built up from the turnbuckle with the assistance of foreign advisers and to foreign designs.

Another important lesson that may be gathered from the transatlantic voyage of the R-34 is that lighter-than-air craft have now reached a size where their cruising range is on the whole sufficient to cross the Atlantic against headwinds such as aircraft will generally encounter when flying westward. To be sure, much larger airships will be required for operating a regular passenger, or even mail, service across the Atlantic, but the fact that the feat has successfully been accomplished proves that lighter-than-air craft have reached a point in their progression towards greater perfection which will soon make them eminently desirable as carriers of aerial transport over great stretches of water.

In this branch of human activity the United States should no more remain in an inferior position than in the matter of supplying the Navy with fast airship scouts of long range. The comparatively small difference between war airships and merchant airships makes it possible to quickly fit out the latter for war purposes, just as Germany did in 1914 with her Zeppelin liners. It follows that an American merchant airship fleet would afford the Navy an excellent reservoir in which to pick fleet scouts in case of war, not to speak of the additional number of trained pilots and crews that would thus become available for naval service.

These patriotic considerations as well as pride to see a portion of the world's coming air borne traffic carried under the American flag should make a sufficiently strong appeal to Americans to commence the development of large rigid airships; but this is unfortunately well-nigh impossible without government assistance of some sort because of the very high initial cost of experimental work and the establishment of suitable airship stations. Congress would do well to seriously consider this problem and to promptly devise means for overcoming our great deficiency.

Responsibility of Congress

CONGRESS in appropriating $25,000,000 for each of the two Air Services again puts on the Senate and House the responsibility for any failure of aerial defence of this country should we have trouble before adequate provision can be made for aircraft and flying personnel.

The aircraft industry which has done so much creditable work in demonstrating that the United States is not behind other countries in design and construction of airplanes is dealt a staggering blow. Instead of receiving encouragement to achieve further triumphs, notice is served on the manufacturers of aerial material to mark time in development work, construct a few airplanes and await further action by Congress when the future of the Army and Navy is to be considered.

To those who can penetrate the mental processes of our representatives in Congress, comes the impression that both the House and Senate are not satisfied to entrust large appropriations to branches of the Army and Navy. The duplication that was apparent in the military and naval appropriation requests may have had much to do with the feeling that the Air Service should be a separate and independent force. If some such result should come from the present unfortunate situation, some excuse can be offered, but if a year goes by without further aviation legislation, the United States will take rank as the sixth or seventh nation in aeronautics.

Japan and Aviation

JAPAN has commenced to develop an Air Service on a scale worthy of its Army and Navy. At present one hundred French officers who have had experience at the front, in shops and technically trained are instructing Japanese officers and soldiers and sailors in aeronautics. Japan evidently intends to use French aviation as its guide. If it does, a great advance may be expected from the Orient.

American Flying Club Dinner to NC Heroes

(*Continued from page* 7)

the bald results of that, and of the flights to take place in the near future will hasten the heralding of the dawn of that morrow on which we will see aviation as a successful commercial proposition.

Captain Craven, U. S. N.

Captain T. T. Craven: Mr. Toastmaster, Mr. President, ladies and gentlemen: The introduction of our worthy toastmaster recalls to my mind a saying of one of our British friends, the Hon. Joseph Chamberlain, who stated that upon one occasion when called upon to address a brilliant assemblage, the toastmaster opened or began his remarks by stating that it was time to cease enjoying themselves and to listen to Mr. Chamberlain. I don't know whether our toastmaster meant the same in this instance or not. It is very hard for me to say anything original here or to do more than to repeat what has already been said. We are glad to be here this evening to congratulate the gallant officers of the service to which I belong. As has been hinted, one is prone to compare their feat with that of our gallant British cousins who successfully made the jump across in one flight, but as Commander Reed has pointed out, I think that their act does not suffer by comparison. The deed which they accomplished was conceived during the war time. It was intended as a war feat. It was carefully studied and preparation was carefully made with the idea that it might become necessary as a war measure. No reasonable precaution was overlooked, and as he has pointed out, we think that the effort and the expense and the time given over to this experiment were all well worth while.

He has mentioned the wonderful work of his radio compass. We also must think of the communication system which was developed and used for this passage. We must think of the meteorological work which it was necessary to carry on. We received information of all these things.

Our spokesman or chairman has mentioned fog. I tonight congratulate Commander Reed and his associates in returning to old New York finding that alcoholic fog dissipated, I mean done away with here, and he is able now to find a purer form of enjoyment which is not marred by a headache or anything of that nature.

As I say, there is nothing that I can think of which we can add to what has already been uttered in praise of the efforts of Reed and his companions. They have written their names indelibly on the scroll of fame, where they will always remain. There is nothing more to be said in their behalf.

Lieutenant Commander Bellinger

Lt. Commander P. N. T. Bellinger: I want to specially remark on the very wonderful aerial demonstration which was made on our arrival in very disagreeable weather, but on a very joyous occasion for us, and I want to express my appreciation of what has been tendered to us this evening. I thank you.

Toastmaster Hedges: Now, I don't know Commander Towers except tonight. We are intimate friends from now on. You men are just acquaintances. We are friends. And I am strong for him. He had the responsibility; he had the directing force; to him would have been charged failure if none of them had gotten over there, and therefore the fact that one of them did get over there in no wise diminishes the credit of the commanding officer. (Applause.)

I present him to you and I know you will like him. Of course, you respect him, but there is a heap of difference between liking people and respecting them.

Commander John H. Towers

Commander Towers: I feel very much honored at being invited to speak here, but I must confess that the Toastmaster is wrong in saying among those present are only acquaintances. I happen to know that I have a great many friends here. They all know me so well that they know I cannot speak, that I am merely going to talk.

I should like to first take this opportunity of thanking those friends, and the many million other friends that I have since discovered, for worrying about the NC-3 while we were down in the fog. If those friends had known the crew of the NC-3 as well as I did, they wouldn't have worried. A great deal has been made of all of us since that flight, and the limelight has been rather centered upon Lieutenant Commander Read, Lieutenant Commander Bellinger, and myself, but I am sure that both of these officers will join me in saying that we were only one each of a crew of six and we only did one job, and there were five other people in each of those planes, a great many of whom are sitting around a little table here very modestly, who had just as much, if not more, to do with this flight as we did. (Applause.)

I should like to take this occasion to point out the purposes of the flight. As you all know, it was a project approved by the Navy Department, and the principal purpose behind the whole thing, as far as the Navy Department was concerned, was to work out by means of this flight many problems that were only about half understood. They intended from the very beginning to make it a go. The reason it was a go was because it was whole departmental proposition. It was by no means a one man job or three, or eighteen—the number of the crew. It was entirely due to the fact that the Navy Department was behind this project from beginning to end that it was a success, and no one appreciates that as much as we who came in contact with the various ships, supply ships, destroyers, etc., which were all on their stations with the proper material, proper signals, and at the proper time.

It sounds very simple, but it wasn't simple at all. The names of the officers who were responsible for working out that project will probably never really seriously be connected with the flight. Their work was all drudgery, and they deserve just as much credit as any of the officers who took part in it. We have present at the Speakers' table here this evening quite a number of them All those present who are connected with aviation know them, there is no need of introducing them. There are certain others who are not present, and I should like to enumerate those officers, but I realize that it is impossible to do so. Certainly, when I finish my report, if I ever do finish it, their names will go down, and the Navy Department at least will have a record of who accomplished the Trans-Atlantic flight.

Selection of the Route

A great many people have asked me about the selections of the route. I am afraid I must assume responsibility for the selection of the route. The principal question was: "Why go to England? When you fly to Lisbon, you cross the Atlantic, why not quit?" Well, I don't know really why I laid down the route that way. It just sort of seemed the natural thing to do, to end up the flight in England. And I should like to say to General Charlton this evening that had we known what we were going to get when we got to England, in the way of a reception, we never would have gone there, because he shortened our lives about ten years, he and his compatriots.

I am going to take exception to another remark that was made this evening by Lieutenant Commander Read, and that is in regard to the size of the Atlantic Ocean. It all depends, like a great many other things, on the point of view. Lieutenant Commander Read looked at the ocean from the point of view of a bird, Lieutenant Commander Bellinger and I had had the doubtful pleasure of looking at it from the point of view of a fish. It makes an awful lot of difference.

There is one man present here tonight who I am going to single out. Everybody in the Navy connected with aviation wanted to go on this flight. There were certain crews selected, and I think I can say that I had a large hand, or took a large part in the selection of the crews, and I endeavored to select the best officers and men in naval aviation that could possibly be had. There has frequently been made to me the remark that "I would give an arm to go on that Trans-Atlantic flight." There is present, tonight one man who was selected, and in line of duty, the night before we left from Rockaway, did give an arm—Chief Special Machinist Howard.

I am going to insert in here one further little remark about the purpose of this flight, and this is confidential, absolutely. There were two purposes. I have named the first one—that was the Navy Department's purpose. There was another one, and that was to prove to the Navy Department, on the part of the Naval Aviation, that seaplanes had come, and that they had come to stay; and it remained to Lieutenant Commander Read to prove it. And the people who are the biggest backers of aviation in the Navy today are the very officers who were out on those destroyers, in that fog and storm that we ran into, who didn't see because they couldn't see, but who received radio messages from the NC-4 that she was on her way, because she went through weather that absolutely did stall those destroyers. And when we finally reached Lisbon I had several destroyer captains come around me to really seriously discuss the question of fitting wings on their destroyers. We told them that that was the next move.

Lack of Vision

As regards the future of aviation which subject Lieutenant Commander Read has discussed, I am afraid I have been in it too long to do it myself before so many people, because I have found that you have got to change your mind about once every three months in aviation. It is usually because you don't see big enough. I can candidly say that I have no idea as to the future of naval aviation, and I can only quote the remark made to me by a Rear Admiral of the Navy, whom I happen to know two years ago was dead against another blank battleship, because what was the use of building them if all you had to do was to send a seaplane out to sink 'em? And I think that the time is coming and coming very soon when the Navy Department is perhaps not going to that limit. As a conservative officer, I hope they won't, but when are they going to realize that they have in aircraft the primary medium of naval warfare?

Senator New of Indiana

Senator Harry S. New: I shall follow the injunction that was placed upon me by a certain gentleman a few minutes ago and shall make no reference to him, but some of the remarks that have been made thus far this evening by a certain individual brought the suspicion on my part that one thing that he had wondered at this evening is, if these very gallant gentlemen saw more water on their transatlantic trip than we have this evening, or if it was more difficult to conduct a flight by airplane over than it is to conduct an oratorical flight over the same fluid.

When I was invited to come this evening, I did so, I respond with pleasure as an American and as a senator of the United States to extend my congratulations to and to express my pride and that of all Americans in an accomplishment of our honored guests of this evening.

From the earliest days the American Navy has reflected the greatest credit and glory upon the fair name of the United States.

Tonight the shades of John Paul Jones and Barry and Decatur and Farragut and Sampson and Schley and Porter and Dewey smile down upon these their successors as all America doffs its hat to them and extends its congratulations and good will.

And then I was glad also to come, because I believe that I am a friend of aviation.

I have unlimited faith in its future, but why speak of its future when its present is so happily before us? When we have already accomplished such great things? In view of what has been done by these gallant gentlemen, in view of what has been done by our gallant compatriots, our British cousins, the future opens up a field that is almost beyond vision.

I don't think anything that was said by Commander Towers about the possible development of aviation was too extravagant. I see things as he sees them, myself. As to what the future may be, I believe that the next war—and I am one of those who doubt seriously if our boasted League of Nations is going to be sufficient in stopping another war—I believe that there will be other wars in the days to come, and I believe that in them these twin agencies of the air, the airplane, the airship and chemical warfare, are going to be the chief agencies in waging it and bringing it to a close.

Holds the World's Attention

Aviation is certainly a great subject and one that holds the attention of the world today as perhaps no other does. America is the birthplace of aviation. The first lighter-than-air plane, the first dirigible was launched in the United States. It is just one year less than a century since Rufus Porter, as is shown by the records in the Patent Office at Washington, launched the first model of a lighter-than-air plane, of a dirigible. That is, he made his model, put in it a little steam engine because that was before the days of gas engines, and actually gave a demonstration with his model, but when it came to the building of a ship, he had to stop because he couldn't get the meagre amount of money in those days, amounting to what wound today seem a paltry sum, but he couldn't get it for the purpose of building that ship, and the project lapsed and was not again undertaken for a great many years, and then not in the United States.

As to the progress of aviation we are apt to think that it has been slow, and so it has, in a way, and yet all things considered it has been more rapid than the development of navigation by steam. The future of aeronautics is going to be as great and the development greater than has been the development of steam ocean going craft. It is not very long ago, not more than ninety days since one of the foremost railroad presidents of the United States, living here in New York, said to me that he believed the day was here when the railroads had to take into account a lessening of their receipts, because of the competition that was going to be offered by aircraft in the carrying of mail, of parcel post, and light freights, express and things of that kind.

I don't know to what extent and degree the competition that is to be given to the railroad by airplane now is going to match the experience of the trolleys and the automobile. Perhaps it may not go that far. I doubt if it does, but that it is going to be something substantial I have no particle of doubt.

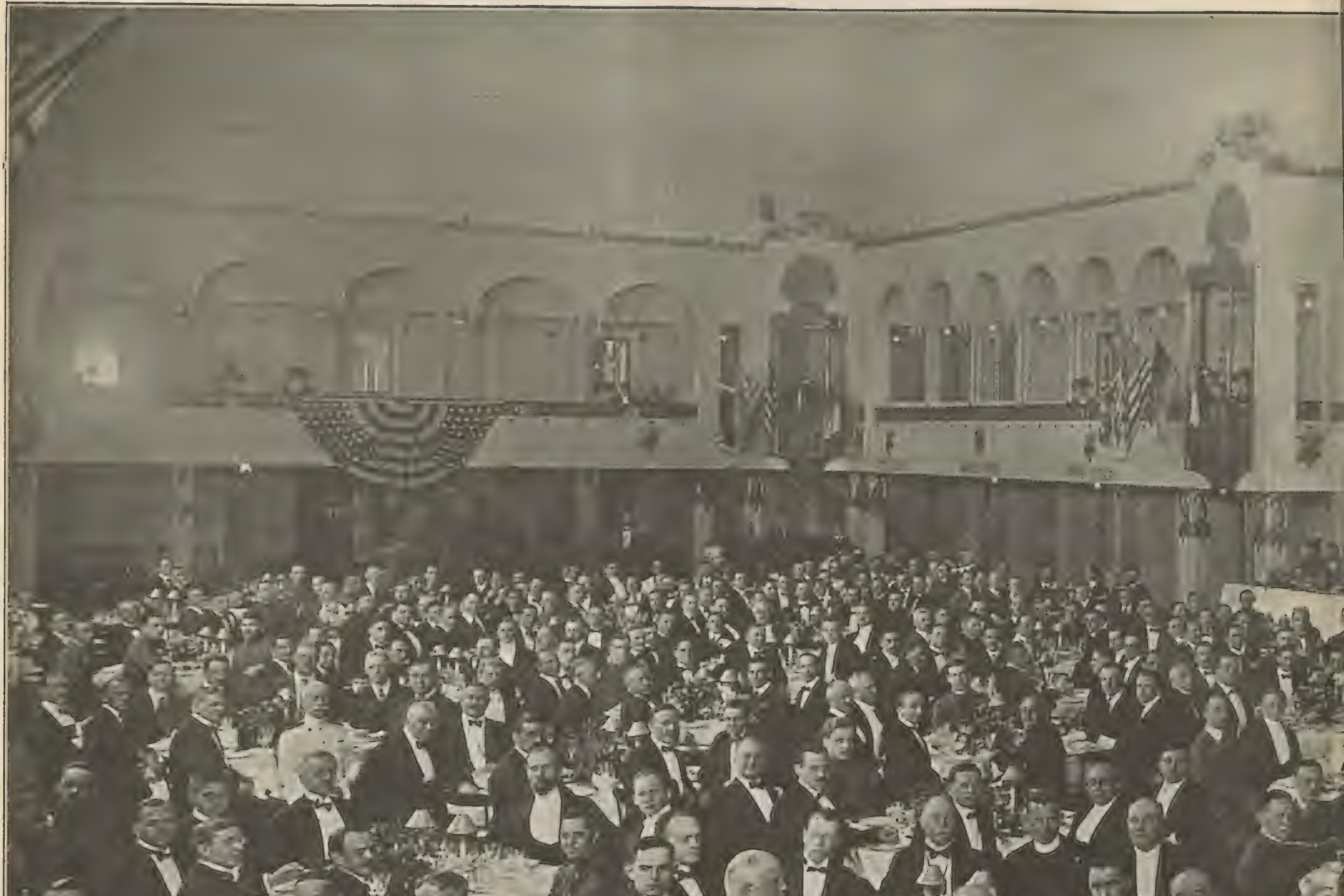
I congratulate the Navy upon having received at the hands of Congress a few days ago, a sum not as great as they should have had, not as great as I would have been glad to give them, nor as great as that for which they asked, but a sum that is much more commensurate with their needs than that which was given to the Army by my confreres. I can only say that I stayed with that Committee all day and all night for a week, trying to get them to bring up the amount that they gave the Army, and that it was reduced to what I regard as an altogether inadequate sum, is due to no fault or no lack of interest on my part.

I wish I knew the names of all who were interested in this great accomplishment. I do know of some who have not been mentioneed. I know of Admiral Taylor, whose perseverance and whose interest contributed greatly to the success of that effort. I know of Commander Hunsaker, whose skill and whose industry were a great aid, without which the success could not have been attained.

One final word. Recognizing as I do the great value, the great potency, the almost unlimited power of aeronautics as a military arm—I am thinking of it, too, not only with reference to that, but in its commercial aspect, because I believe it has a great com-

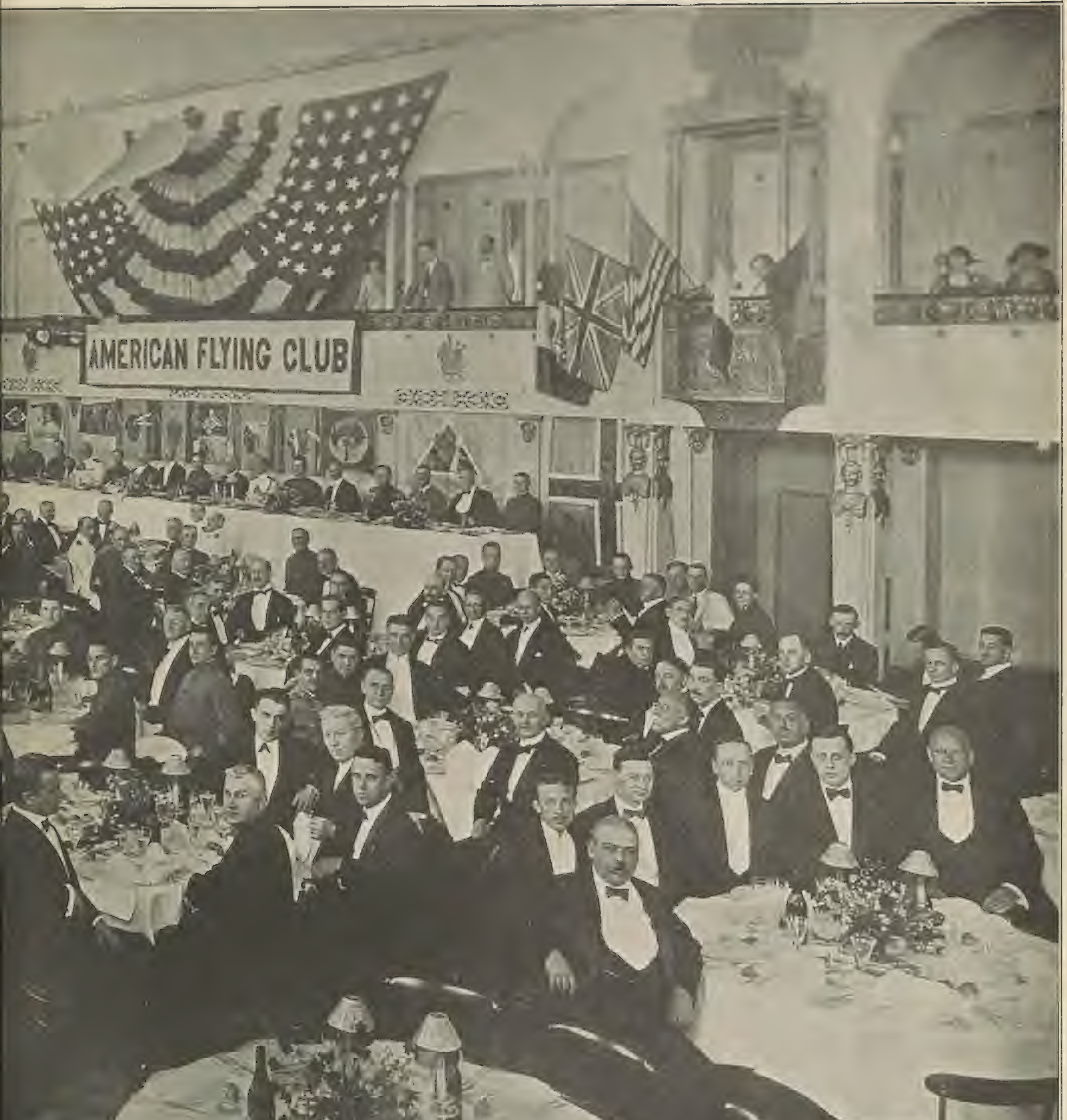
(*Continued on page* 12)

Paying Homage to the Nav



Scene at the American Flying Club's Dinner to the Officers and Crews of the NC

ioneer Trans-Atlantic Fliers



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Held at Hotel Commodore, New York City, Wednesday Evening, July 2, 1919

American Flying Club Dinner to NC Heroes

(*Continued from page 9*)

mercial future, and to that end I believe that it should be made the business of somebody in this country to see that its interests are not lost to the United States.

We are the fathers over here of those two great instruments, the airship and the airplane. I don't want to see it left upon the doorstep a foundling, upon the doorstep of some foreign nation. I want the United States to see to that, to look after its own and to see that America gets what it ought to have and what is properly ours, out of the things which we have ourselves designed and created. It is a fact well known to some of you, most of you here, I think, that today England—and I take off my hat to England for her enterprise, England, France, Italy, they have agents in the South American countries, today, distributing airplanes, gratis in some instances, in order to awaken the interest of those people in commercial aeronautics, in order that they may get for their country the benefit of the trade in countries that know not yet of aeronautics and of airplanes. It should be the business of somebody to look after the interests of the United States in that respect, and as I said before, to that end, I am in favor of the creation of a separate and distinct Department of Aeronautics in this country.

Alcock and Brown Congratulated

Major Connolly: (Applause.) Mr. Chariman, through you, some of the membership desire to express this resolution, which in a way very crudely, extemporaneously, and imperfectly drafted, I think, typifies the breadth and the generosity of American sportsmanship, and American appreciation of great and worthy deeds.

Resolved, That the American Flying Club at the dinner given by the club to commemorate the successful accomplishment of Lieutenant Commander Read and the crew of the NC-4, of the first Trans-Atlantic voyage by air, in conjunction therewith extend to the Royal Air Force and the British Air Service organizations generally our congratulations and felicitations on the extraordinary accomplishment of Lieutenants Alcock and Brown, respectively, in their successful and epochal trans-oceanic flight, and also the courageous and sportsmanlike effort of Harry Hawker and Lieutenant Commander Grieve. We await with hopeful and hospitable anticipation the arrival of the R-34, and its gallant crew.

Mr. Chairman, I desire the adoption of this resolution.

President Driggs: Gentlemen, upon the exhibition of your approval the chair will have this message sent to the Royal Flying Corps Club of England by its own wireless which is on the roof of the Club house. It is a great pleasure to the Club to announce that a prize has been offered for an international contest to be held for the third week in August between Toronto, Canada, and New York City. At that time, an exposition will be held in Toronto, and the race will start from both ends. The Club has appointed a Contest Committee, comprising some of the most distinguished aviators and sportsmen in the United States. We hope that this will be the first of many such contests offered. It has been arranged that the Prince of Wales will be present at this exposition in Toronto at that time, and that he shall start the race. A prize of $5,000 has been offered by John E. McBowman. (Applause.)

Following is a list of officers of the American Flying Club, Inc., No. 11, East Thirty-eighth Street:

President, Laurence La Tourette Driggs.

Vice-Presidents, Major General Leonard Wood, Captain Eddie Rickenbacker, Cortlandt Field Bishop, F. G. Diffin.

Secretary, Major Maurice Connolly.

Treasurer, Lieutenant M. Leslie Hull.

Honorary President, Major General Charles T. Menoher.

Honorary Vice-President, Honorable Franklin K. Lane.

Honorary Life Member, Brigadier General William Mitchell.

Honorary Member, Colonel Thomas D. Milling.

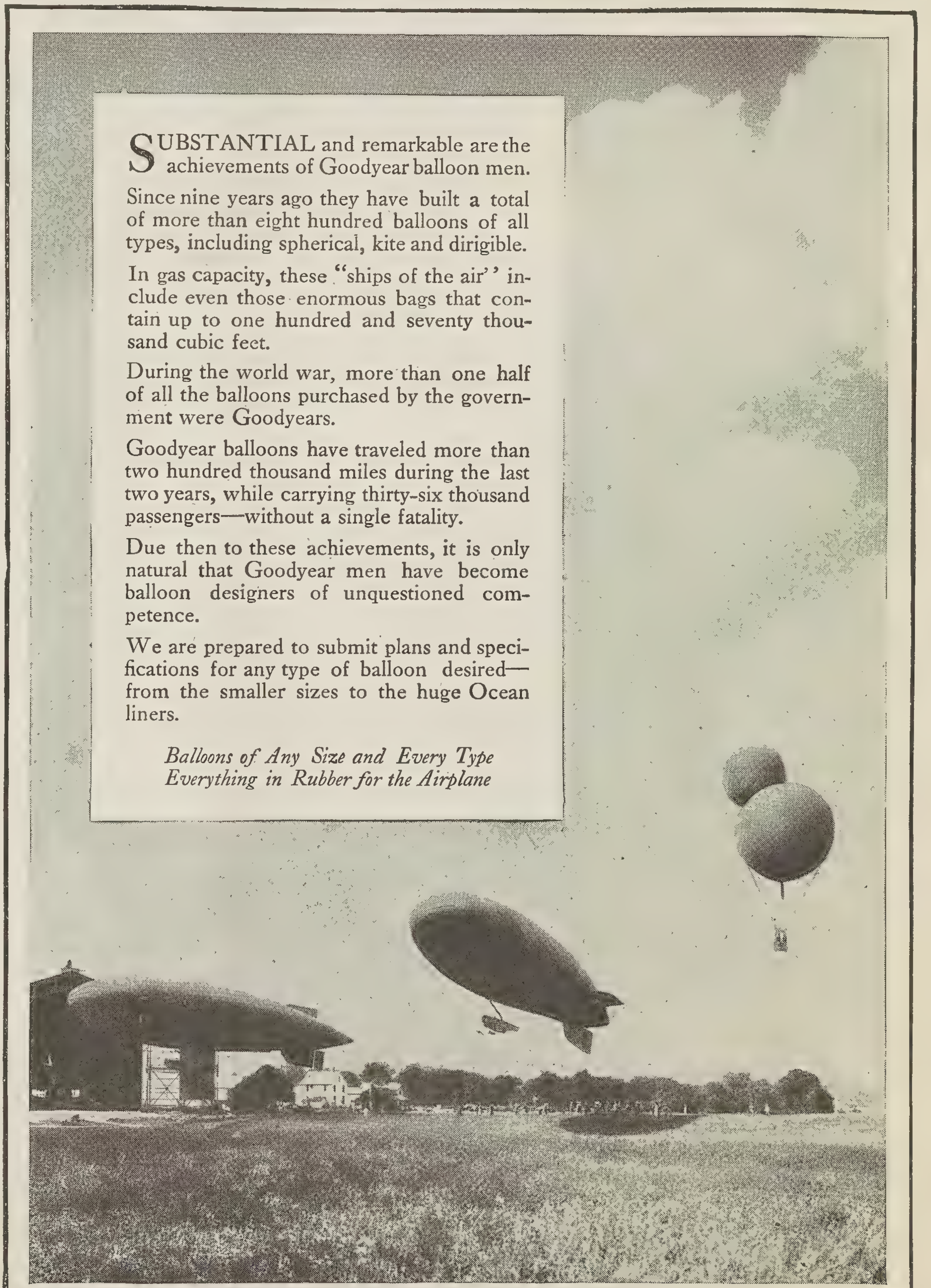
Board of Directors, Major Charles Biddle, Andalushia, Pa.; Lieutenant Paul Baer, New York City; Cortlandt Field Bishop, New York City; Lieutenant-Col. Hiram Bingham, New Haven, Conn.; Samuel S. Bradley, New York City; Gutzon Borglum, New York City; Lester Barlow, New Haven, Conn., now at Clear Lake, Iowa; Commander E. W. Coyle, U. S. N., Washington, D. C.; Colonel Milton P. Davis, Washington, D. C.; Lieutenant F. Trubee Davison, Locust Valley, L. I.; Frank H. Diffin, New York City; Captain Roy N. Francis, Washington, D. C.; Colonel Robert Glendenning, Philadelphia, Pa.; Harry Payne Whitney, New York City; Captain James Norman Hall, Colfax, Iowa; Major Clifford B. Harmon, New York City; Lt.-Col. Harold E. Hartney, Washington, D. C.; Lt. M. Leslie Hull, New York City; Capt. Marc Lagen, B. S., New York City; Charles E. Manly, Buffalo, N. Y.; Lt. Percy Pyne, Jr., New York City; Commander Scofield, U. S. N., New York City; Capt. Elliott Springs, S. C., or New York City; Lt. Col. William Thaw, Pittsburgh, Pa.; Chance Vought, New York City; Major C. H. Wadsworth, New York City; Lt. Waldo Walker, New York City.

Among the diners were:

Chance Vought, Major Fred Blakeman, Commander F. G. Coburn, John J. Rooney, Colonel V. E. Clark, W. Cullen Morris, Frank Vernon, Col. Lester M. Horner, Col. W. Lucas, Andrew L. Riker, Lt. L. T. Barin, Lt. Harry Sadenwater, Chief Machinist Mate C. S. Kessler, Engineer R. Christansen, Lt. David McCullough, Lt. R. A. Lavender, Machinist L. A. Moore, Lt. E. F. Stone, Lt. Walter Hinton, Lt. J. P. Breese, Jr., Ensign H. C. Rudd, Machinist E. S. Rhoades, E. H. Howard, Commander A. K. Atkins, Lt. Comdr. S. M. Kraus, Capt. N. B. Hall, Lt. G. M. Brush, W. A. Edmundson, Lt. R. S. Wentworth, Lt. G. H. Murray, Ensign G. J. McCarthy, Luther K. Bell, Lt. C. A. Tinker, Col. H. M. Hickman, Lt. Kenneth Leggett, Albert Shaw, Sidney R. Cook, David Becroft, John D. Ryan, Elmer A. Sperry, H. B. Mingle, Benj. L. Williams, William B. Saunders, Wm. C. Potter, Albert H. Flint, Charles L. Laurence, Roger Pero, William Rockefeller, Jr., Capt. Jacques Swaf, Lt. Sam Pierce, F. H. Diffin, Roy Conger, Major G. R. Wadsworth, Arthur Johns, Frank H. Russell, Leeds Johnson, Curtiss Gardner, C. T. Fairfield, William F. Bleakley, Lawrence Donahue, Lester D. Gardner, Alexander Klemin, George Newbold, Spencer Heath, Frank Stanton, Albin McCauley, Edson Gallaudet, Glenn L. Martin, George Bell, Capt. Fred B. Renschler, John R. Rodgers, J. R. Cautley, Henry R. Sutphin, Frank L. Morse, C. W. Mix, J. B. Taylor, Jr., Harry E. Tudor, Charles H. Towne, B. J. Greenhut, Robert W. Chambers, Charles L. Lawrence, Robert Grier Cook, Capt. David H. Webster, F. G. Erickson, Comdr. Kirby Smith, Lt. Comdr. R. E. Byrd, Jr., A. L. Hausteter, Lt. E. C. Parsons, Raymond Orteig, Capt. Chandlier Smith, Lt. Thos. McConchie, Donald Grey, Captain Eypper, C. H. Danforth, Capt. E. A. Clune, Judge W. Benton Crisp, Lt. Col. J. F. Stover, Major V. Page, Frederick Garguila, Alexander Pomilio, Grover C. Loening, Major Albert Loening, Russell Vought, Lt. James A. Taylor, George H. Townsend, Lt. John M. Rutherford, Walter Fairchild, Ensign Gilder, Israel Ludlow, C. T. Michie, Harry Bijur, C. J. Lake, Herman Metz, G. Douglas Wardrop, Stuart Hartshorn, Major Edward J. McShane and Lt. George N. Gregory.

General Foulois Returns

Among the passengers brought back on the Leviathan was Brig. Gen. Benjamin D. Foulois of the Army Air Service who returned from twenty months' service in France.



SUBSTANTIAL and remarkable are the achievements of Goodyear balloon men.

Since nine years ago they have built a total of more than eight hundred balloons of all types, including spherical, kite and dirigible.

In gas capacity, these "ships of the air" include even those enormous bags that contain up to one hundred and seventy thousand cubic feet.

During the world war, more than one half of all the balloons purchased by the government were Goodyears.

Goodyear balloons have traveled more than two hundred thousand miles during the last two years, while carrying thirty-six thousand passengers—without a single fatality.

Due then to these achievements, it is only natural that Goodyear men have become balloon designers of unquestioned competence.

We are prepared to submit plans and specifications for any type of balloon desired—from the smaller sizes to the huge Ocean liners.

Balloons of Any Size and Every Type
Everything in Rubber for the Airplane

GOODYEAR
AKRON

Beardmore
BEST UNDER THE SUN

(© Keystone View Co.)

The R-34, Built by Beardmore, Lands in the United States.

The first lighter-than-air craft to cross the Atlantic
The first aircraft to cross the Atlantic from Europe to America

Total distance covered from East Fortune Air Station to Roosevelt Field, 3,130 sea miles.

Total duration of flight 108 hours and 12 minutes.

Hull and cars manufactured and assembled by Beardmore

In conquering the Atlantic Ocean, the R-34 has inaugurated the era of safe and dependable trans-oceanic air transportation.

Inquiries from American interests will be given careful attention.

THE BEARDMORE AERO ENGINE, LTD.
112 Great Portland Street, London, W. 1.

FAME

C.D.C

Arrival of R-34

(*Continued from page 5*)

Sleeping Arrangements

The sleeping arrangements consist of a hammock for each of the men off watch suspended from the main ridge girder of the triangular internal keel which runs from end to end of the ship. In this keel are situated the eighty-one petrol tanks, each of seventy-one gallons capacity; also the living quarters for officers and men and storing arrangements for lubricating oils for the engines, water ballast, food and drinking water for the crew. The latter is quite a considerable item, as will be seen from the following table of weights:

	Gals.	Lbs.	Tons.
Petrol	4,900	35,300	15.8
Oil	—	2,070	.9
Water	—	—	3
Crew and baggage......	—	—	4
Stores	—	550	.2
Drinking water	—	800	.42
Total..............	—	—	24.32

Life in the keel of a large, rigid airship is by no means unpleasant. There is very little noise or vibration except when one is directly over the power units—a total absence of wind and, except in the early hours of dawn, greater warmth than in the surrounding atmosphere.

Getting into one's hammock is rather an acrobatic feat, especially if it is slung high; but this becomes easy with practice—preventing one's self from falling out is a thing one must be careful about in a service airship like the R-34.

There is only a thin outer cover of fabric on the underside of the keel on each side of the walking way, and the luckless individual who tips out of his hammock would in all probability break right through this and soon find himself in the Atlantic.

It is surprising the amount of exercise one can get on board an airship of this size. The keel is about 600 feet long and one is constantly running about from one end to the other. There are also steps in a vertical ladder to the top of the ship for those who feel energetic or have duty up there. By the time it comes one's turn to go to bed one generally finds one is very sleepy and the warmth of one's sleeping bag and hum of the engines soon send one to sleep.

Remarkable Rainbow Effects

3:15 P. M.:

Sea now visible at intervals through the clouds—a deep blue in color, with a big swell on. Our shadow on the water helps us to measure our drift angle, which both Scott and Cooke worked out to be 21 degrees. Running on the forward and two aft engines, resting the two wing engines. Speed, making good forty-nine miles per hour.

Durrant, the wireless officer, reports he has been speaking to St. John's, N. F.—rather faint but quite clear signals. As we are still in touch with East Fortune and Clifden and have been exchanging signals with the Azores since reaching the Irish coast, our communications seem to be quite satisfactory.

Remarkable rainbow effects on the clouds: one complete rainbow encircled the airship itself and the other—a smaller one—encircled the shadow. Both are very vivid in their coloring.

3:40 P. M.:

Excellent tea consisting of bread and butter and greengage jam, also two cups of scalding hot tea which had been boiled over the exhaust pipe cooker fitted to the forward engine.

Fruitarian cake was also tried for the first time—rather sickly to taste, but very nourishing. The whole assisted by Miss Lee White on the gramaphone. We would one and all give anything for a smoke. Greenland, the first officer of the ship, is vainly trying to discover the culprit who used his toothbrush for stirring the mustard at lunch.

4:30 P. M.:

Still in fog and low clouds and no sea visible. We have hardly seen any sign of the Atlantic since leaving the Irish coast and we are beginning to wonder if we shall see it at all the whole way across.

Talks with a Steamer

5 P. M.:

Tramp steamer SS. Ballygally Head, outward bound from Belfast, destination Montreal, picked up our wireless on their Marconi spark set which has a range of thirty miles only. She heard us, but didn't see us, as we were well above and completely hidden by the clouds. She gave her position as latitude 54 degrees 30 minutes north, longitude 18 degrees 20 minutes west, and reported as follows:

Steering south southwest true, wind north, barometer 30.10, overcast, clouds low.

SUFFREN, Master.

They were very surprised and most interested to hear we were R-34, bound for New York, and wished us every possible luck.

5:30 P. M.:

Messages were received from both H. M. S. battle cruisers Tiger and Renown, which had been previously sent by the Admiralty out into the Atlantic to assist us with weather reports and general observation. They reported respectively as follows:

H. M. S. Tiger—"Position 36 degrees 50 minutes north, 36 degrees, 50 minutes west, 1,027 millibars, falling slowly, thick fog."

H. M. S. Renown—"Position 60 degrees north, 25 degrees west, 1,027 millibars, falling slowly, cloudy, visibility four miles."

Harris's deductions from these reports were to the effect that there was no steep gradient and that therefore there was no likelihood of any strong wind in that part of the Atlantic.

Well Over the Clouds

6 P. M.:

Scott increases height to 2,000 feet, and at this height we find ourselves well over the clouds and with a bright blue sky above us. The view is an enchanting one—as far as one can see a vast ocean of white fleecy clouds ending in the most perfect cloud horizon.

Two particularly fine specimens of windy, cirrus clouds of which Pritchard promptly obtained photographs appear on our port beam, also some "cirrus ventosus" clouds—little curly clouds like a blackcock's tail feathers—all of which Harris interprets as a first indication and infallible sign of a depression coming up from the south.

We hope that this depression when it comes may help us provided we have crossed its path before it reaches us. If we can do this we may be helped along by the easterly wind on the northwesterly side of the depression.

It is interesting to note that as yet we have received no notice of this depression coming up from the south in any weather reports.

6:40 P. M.

Put back clock one-half an hour to correct Greenwich mean time. Time now 6:10 P. M. Position—Latitude 53 degrees 50 minutes north; longitude 20 degrees west.

We have covered 610 sea miles measured in a direct line in seventeen hours at an average speed of 36 knots, or forty miles, per hour. Depth of Atlantic at this point, 1,500 fathoms. At this rate, if all goes well and if that depression from the south doesn't interfere, we should see St. John's—if visible and not covered in fog, as it usually is—about midnight tomorrow, July 3.

Forecast Confirmed

Conditions unchanged in British Isles. Anticyclone persistent in Eastern Atlantic—a new depression entering Atlantic from south.

This confirms Harris's forecast and is an admirable proof of the value of cloud forecasting.

7 P. M.:

The clouds have risen to our height and we are now driving away to them with no signs of the sky above or the sea underneath. Scott reckons the wind is northeast by east and helping us slightly. Airship now very heavy, owing to change in temperature and 12 degrees down by the stern. Running on all five engines at 1,600 revolutions; height 3,000 feet.

8 P. M.:

We are just on top of the clouds, alternately in the sun and then plunging through thick banks of clouds. The sun is very low down on the western horizon and we are steering straight for it, making Pritchard at the elevators curse himself for not having brought tinted glasses. Ship now on an even keel.

8:30 P. M.:

Scott decided to go down underneath the clouds and increases speed on all engines to 1,800 revolutions to do so. Dark, cold and wet in the clouds, and we shut all windows.

We see the sea at 1,500 feet between patches of cloud. Rather bumpy.

We now find ourselves between two layers of clouds, the top layer 1,000 feet above us and the lower layer 500 feet below, with occasional glimpses of sea.

9 P. M.:

The sun is now setting and gradually disappears below the lower cloud horizon, throwing a wonderful pink glow on the white clouds in every direction. Course steered 320 degrees. Course made good 299 degrees. Air speed 44 knots, speed made good 55 miles per hour.

All through this first night in the Atlantic the ordinary airship routine of navigating, steering and elevating, also maintaining the engines in smooth-running order, goes, watch and watch, as in the daytime.

The night is very dark. The airship, however, is lighted throughout, a much enlarged lighting system having been fitted. All instruments can be individually illuminated as required, and in case of failure at the lighting system all figures and indicators are radiumized.

The radium paint used is so luminous that in most case the lighting installation is unnecessary.

The Second Day

8:20 A. M., Thursday, July 3:

The clock has been put back another hour to correct our time to Greenwich mean time. Position—longitude 35 degrees, 60 minutes west, latitude 53 degrees north.

Cooke got position by observation on sun and a good cloud horizon and considers it accurate to within thirty and forty miles.

Our position is over the westbound steamship route from Cape Race to the Clyde and momentarily crossing the eastbound route from Belle Isle to Plymouth.

We are well over half way between Ireland and Newfoundland and are back again on the great circle route, having been slightly to the south of it, owing to the drift effect of a northerly wind.

Good weather report from St. John's.

12:45 P. M.:

Durrant is speaking S. S. Canada on our spark wireless set so there may be a chance of our seeing her shortly as the sea is temporarily visible. The second wireless operator obtains his direction on our directional wireless so that we may know in what direction to look for her. All we know at the moment is that she is somewhere within 120 miles.

Capt. David, in command, wishes us a safe voyage. We gaze through our glasses in her direction, but she is just over the horizon.

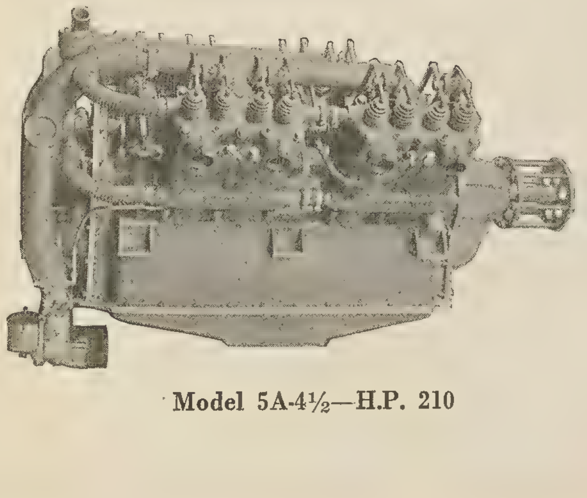
2 P. M.:

Slight trouble with starboard amidships engine; cracked cylinder water jacket. Shotter, always equal to the occasion, made a quick and safe repair with a piece of copper sheeting, and the entire supply of the ship's chewing gum had to be chewed by himself and two engineers before being applied.

4:30 P. M.:

We are now on the Canadian summer route of steamers bound for the St. Lawrence via Belle Isle Strait and over the well known Labrador current.

(*Continued on page 16*)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Arrival of R-34

(*Continued from page* 14)

There are already indications of these cold currents in the fog which hangs immediately above the surface of the water.

Scott and Cooke spend much time at chart table with protractors, dividers, stop-watches and many navigational text-books, measuring angles of drift and calculating course made good.

Aerial navigation is more complicated than navigation on the surface of the sea, but there is no reason why, when we know more about the air and its peculiarities, it should not be made just as accurate.

5 P. M.:

Harris unwisely shut his hand in door of wireless cabin—painful but not serious. Flow of language not audible to me, as the forward engine happened to be running.

6 to 7 P. M.:

We are gradually getting further and further into the shallow depression which was reported yesterday coming up from the South Atlantic. For the last four hours the sea has been rising, and now the wind is south-southeast, forty-five miles per hour. Visibility only a half-mile. Very rough sea and torrents of rain. In spite of this the ship is remarkably steady.

At 8 P. M. Scott decides to climb right through it, and we evidently came out over the top of it at 3,400 feet.

8:30 P. M.:

We have now passed the center of the depression exactly as Harris foretold. The rain has ceased and we are traveling quite smoothly again.

A Sky Picture

To the west the clouds have lifted and we see extraordinarily interesting sky—black, angry clouds giving place to clouds of a gray mouse color, then a bright salmon-pink, clear sky, changing lower down the horizon to darker clouds with a rich golden lining as the sun sinks below the surface. The sea is not visible and is covered by a fluffy gray feather bed of clouds slightly undulating and extending as far as the eye can reach. The moon is just breaking through the black clouds immediately above it.

On the east we see the black ominous depression from which we have just emerged, while away more to the south the cloud-bed over which we are passing seems to end suddenly and merge into the horizon.

We are getting some valuable meteorological data on this flight without a doubt and each fresh phenomenon as it appears is instantly explained by the ever-alert Harris, who has a profound knowledge of his subject.

9 P. M.:

One of the engineers has reported sick—complains of feverishness.

Mascots Aboard

A stowaway has just been discovered, a cat smuggled on board by one of the crew for luck. It is a very remarkable fact that nearly every member of the crew has a mascot of some description, from the engineer officer, who wears one of his wife's silk stockings as a muffler around his neck, to Major Scott, the Captain, with a small gold charm called "Thumbs Up."

We have two carrier pigeons on board, which it has been decided not to use. Anyway, whether we release them or not, they can claim to be the first two pigeon to fly the Atlantic.

4.30 A. M., Friday, July 4th:

Wonderful sunrise—the different colors being the softest imaginable, just like a wash drawing.

7 A. M.:

Height, 1,000 feet. Bright blue sky above, thin fog partly obscuring the sea beneath us; sea moderate, big swell.

The fog bank appears to end abruptly ten miles or so away toward the south where the sea appears to be clear of fog and a very deep blue.

Icebergs Sighted

Standing out conspicuously in this blue patch of sea we see an enormous white iceberg. The sun is shining brightly on its steep sides and we estimate it as roughly 300 yards square and 150 feet high. As these icebergs usually draw about six times as much water as their height we wondered whether she was aground, as the depth of water at that point is only about 150 fathoms.

Another big iceberg can just be seen in the dim distance. These are the only two objects of any kind, sort or description we have as yet seen on this journey.

8:15 A. M.:

Fog still clinging to the surface of the water—water evidently must be very cold. Extraordinary crimpy wavelike appearance of clouds rolling up from the north underneath it. Harris has never seen this before. Pritchard took photograph.

On port beam there is a long stretch of clear blue sea sandwiched as between wide expanses of fog on either side looking just like a blue river flowing between two wide snow-covered banks. Cause: A warm current of water which prevents cloud from hanging over it. This well illustrated the rule that over cold currents of water the clouds will cling to the surface.

9 A. M.:

We are now over a large ice field and the sea is full of enormous pieces of ice—small bergs in themselves. The ice is blue-green under water, with frozen snow on top.

A message reaches us from the Governor of Newfoundland:

"To Gen. Maitland, officers and crew, R-34:

"On behalf of Newfoundland I greet you as you pass us on your enterprising journey.

"HARRIS, Governor."

Replied as follows:

"To Governor Newfoundland:

"Major Scott, officers and crew R-34 send grateful thanks for kind message, with which I beg to associate myself. GEN. MAITLAND."

12:50 P. M.:

Land in sight. First spotted by Scott on starboard beam. A few small rocky islands visible for a minute or two through the clouds and instantly swallowed up again.

Altered course southwest to have a closer look at them. Eventually made them out to be the northwest coast line of Trinity Bay, Newfoundland.

Our time from Rathlin Island—the last piece of land we crossed above the north coast of Ireland—to north coast of Trinity Bay, Newfoundland, is exactly fifty-nine hours.

2:30 P. M.:

Crossing Newfoundland

We are crossing Newfoundland at 1,500 feet in thick fog which gradually clears as we get further inland. A very rocky country with large forests and lakes and for the most part no traces of habitation anywhere.

Message from St. John's to say that Raynham was up in his machine to greet us. We replied, giving our position.

3 P. M.:

Again enveloped in dense fog. Message from H. M. S. Sentinel giving us our position. We are making good thirty-eight to forty knots and heading for Fortune Harbor.

4:30 P. M.:

We have passed out of Fortune Harbor with its magnificent scenery and azure blue sea dotted with little white sailing ships and are now over the two French islands, Miquelon and St. Pierre, and steering a course for Halifax, N. S. The French flag was flying at St. Pierre and was duly dipped as we passed over.

7:45 P. M.:

Passed over tramp steamer, S. S. Seal, bound for Sydney, N. S., from St. John's, the first we have seen.

(*Continued on page* 18)

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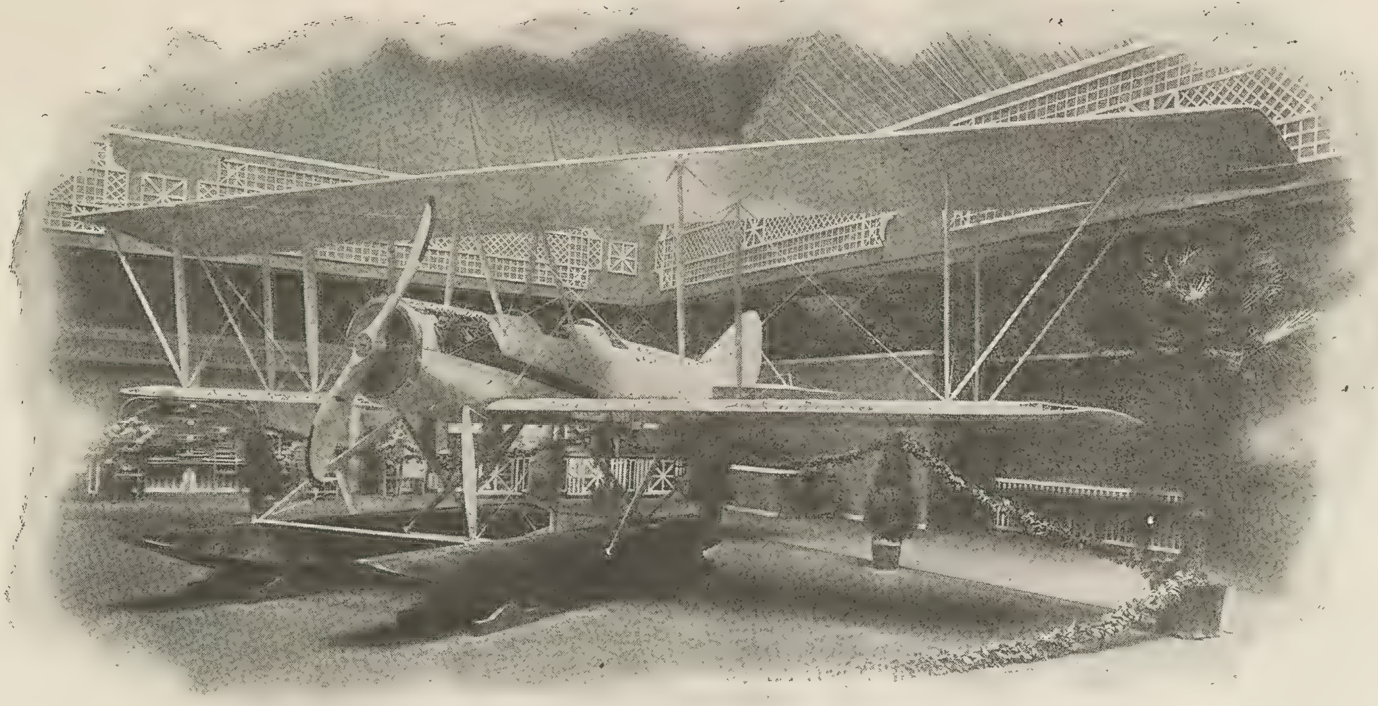

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Arrival of R-34

(*Continued from page* 16)

8:15 P. M.:

Clear weather; sea moderate: making good thirty miles per hour on three engines. Northern point of Cape Breton Island, N. S., just coming into sight. Lighthouse four flashes; we should make Halifax 2:30 A. M., tomorrow.

Saturday, July 5, 2:30 A. M.:

Very dark, clear night. Lights of White Haven show up brightly on our starboard beam and we make out the lights of a steamer passing us to the east. Strong head wind against us. Making no appreciable headway.

7 A. M.:

Scott decided to turn inland to avoid southwest wind barrage flowing up the coast. Crossed coast at Goose Island, Country Harbor.

Miles and miles of endless forests. Here and there a clearing with a hut or two, a few cows and an acre or so of cultivated land. Any number of small rivers and lakes.

10:20 A. M.:

We are down as low as 800 feet smell of pines, which we inhale with delight. Stacked tree trunks look like bunches of asparagus from above.

Put the "wind up" a big brown eagle.

We all agree we must come to Nova Scotia for shooting and fishing.

12:30 P. M.:

Lunch.

Serious Petrol Situation

The petrol question has become distinctly serious. Shotter has been totalling up our available petrol resources with anxious care. We have 500 miles to go to New York and if we don't get any wind or bad weather against us will do it all right with two engines, assisted occasionally by a third engine. We cannot afford to run all five at once owing to the petrol consumption.

Lieut. Commander Lansdowne, United States Naval Airship Service sends signal on behalf of R-34 to United States authorities at Washington and Boston to send destroyer to take us in tow in case we should run out of petrol during the night.

The idea is we would then be towed by the destroyer during the hours of darkness, and at dawn cast off and fly to Long Island under our own power. Let us hope this won't be necessary.

It is now raining and foggy, which is the kind of weather that suits us now, as rain generally means no wind.

3 P. M.:

Passed Haute Island, in Fundy Bay.

3:30 P. M.:

For some little while past there had been distinct evidences of electrical disturbances. Atmospherics became very bad and a severe thunderstorm was seen over Canadian coast, moving south down the coast.

Scott turned east off his course to dodge the storm, putting on all engines. In this, fortunately for us, he was successful and we passed through the outer edge of it. We had a very bad time, indeed, and it is quite the worst experience from a weather point of view that any of us have yet experienced in the air.

During the storm some wonderful specimens of cumulo mammatus were seen and photographed. These clouds always indicate a very highly perturbed state of atmosphere and look rather like a bunch of grapes. The clouds drooped into small festoons.

7:30 P. M.:

We are now in clear weather again and have left Nova Scotia well behind us and are heading straight for New York.

Particularly fine electrical disturbance type of sunset.

9:30 P. M.:

Another Storm

Another thunderstorm. Again we have to change our course to avoid it, and as every gallon of petrol is worth its weight in gold, it almost breaks our hearts to have to lengthen the distance to get clear of these storms.

July 6, Sunday, 4 A. M.:

Sighted American soil at Chatham.

4:25 A. M.:

South end of Mahoney Island. Scott is wondering whether petrol will allow him to go to New York or whether it would not be more prudent to land at Montauk.

5:30 A. M.:

Passing over Martha's Vineyard, a lovely island and beautifully wooded. Scott decided he could just get through to our landing field at Hazelhurst Field, but that there would not be enough petrol to fly over New York. Very sad, but no alternative. We will fly over New York on start of our return journey on Tuesday night, weather and circumstances permitting.

Landed 1:54 P. M. Greenwich mean time, or 9:54 A. M., U. S. A. summer time, at Hazelhurst (Roosevelt) Field, Long Island.

Total time on entire voyage, 108 hours 12 minutes

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This statement was made June 6 by Major J. E. M. Pritchard of the British Air Forces, the Air Ministry expert on board of the R-34, a man fully conversant with the past and proposed future of British aircraft building. A representative of some Australian papers asked him if the R-34 might make a trip to Australia.

"Oh, no; not this ship. She couldn't do it. But in a year we'll have ships that can. In a year it will be just as easy for our ships to make a non-stop flight to Australia as it has been to make this journey. We'll have some great ships in a year.

"This flight was not really an amazing thing. It is the result of long years of work. It was not wonderful. What I do call wonderful is the persistent and unspectacular work that led up to it. All this congratulation really seems to me a bit out of place. It's the past work that is the thing.

"I want to emphasize the fact, too, that it is far easier to fly from here to England than it is to fly from England here, because of the tremendous air currents. I might say that as a matter of air miles America is nearer to England by 1,000 miles than England is to America.

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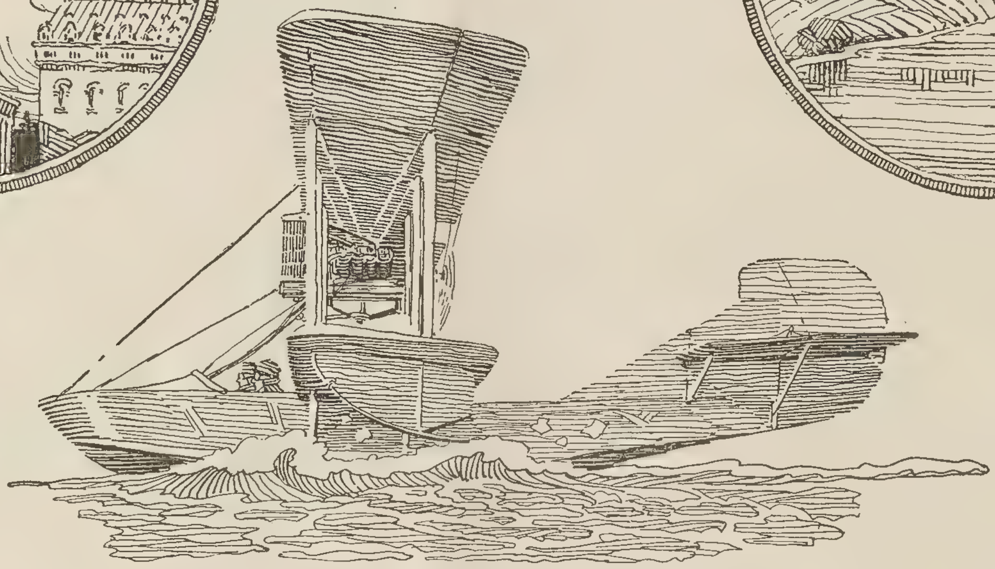

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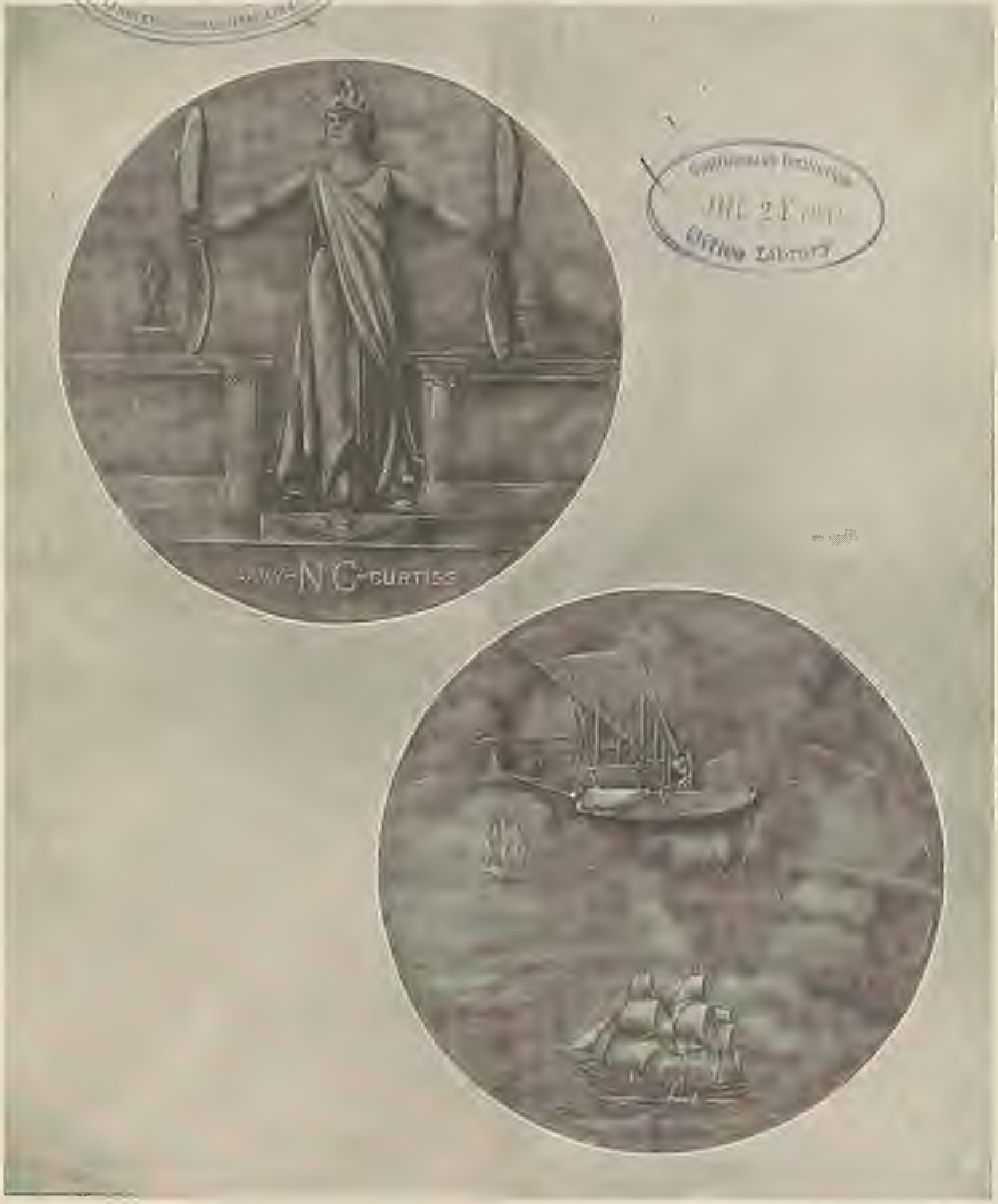

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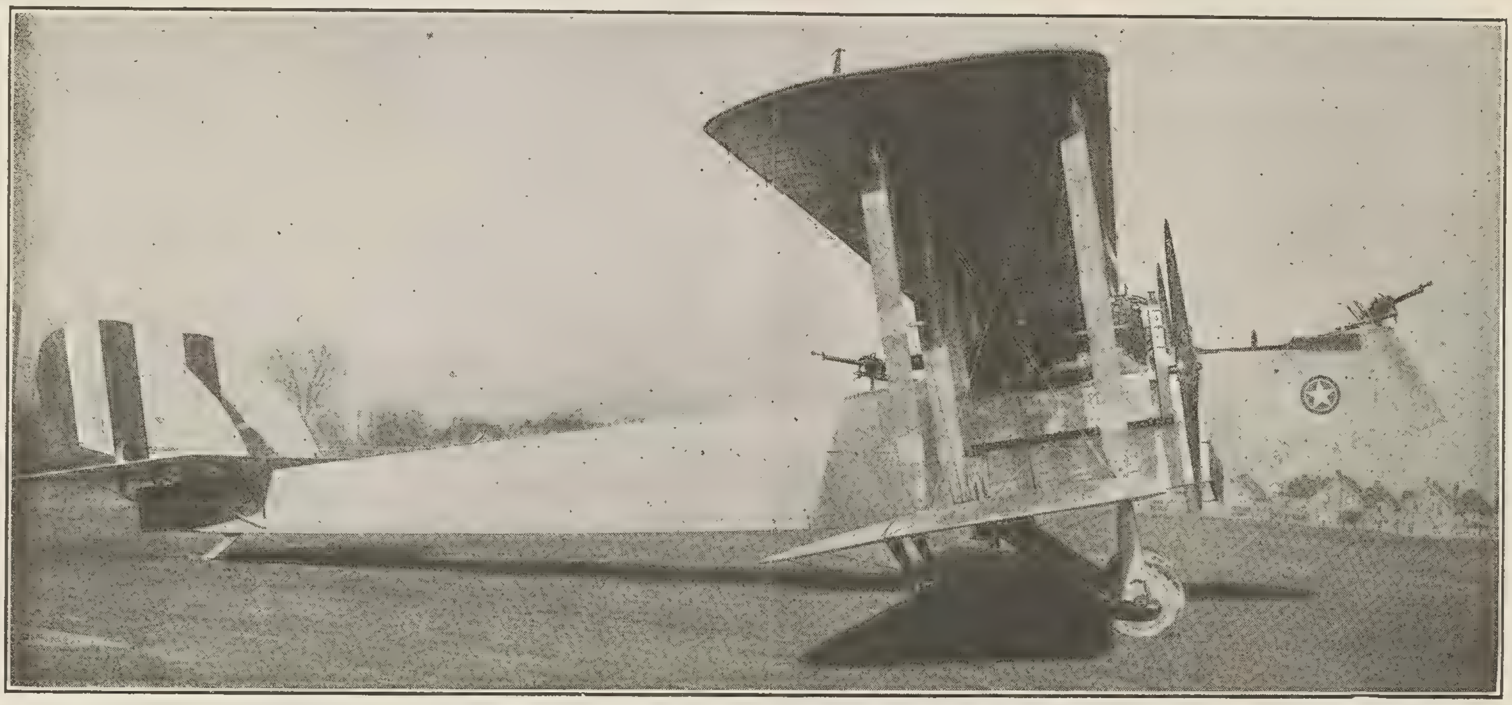

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Congress Fails to Provide for Army Air Service

Disintegration Commences Caused By Blind Curtailment of Appropriations

The disintegration of the Army Air Service due to the lack of funds has commenced. With $25,000,000, the appropriation for the coming fiscal year, the United States will fall so rapidly behind that it will take many years and large appropriations for the Air Service to reach a par with other countries. If the present plans of the War Department are carried out the Army Air Service will have only 250 officers by September 30 of this year.

This situation has been caused by the general feeling in Congress that all appropriations for the Army should be curtailed to a minimum until a definite reorganization plan can be formulated. The advocates in Congress of an independent Air Force believe that until a union is made of all air activities of the Government that there will be great duplication and wastage and therefore were against large appropriations at this time.

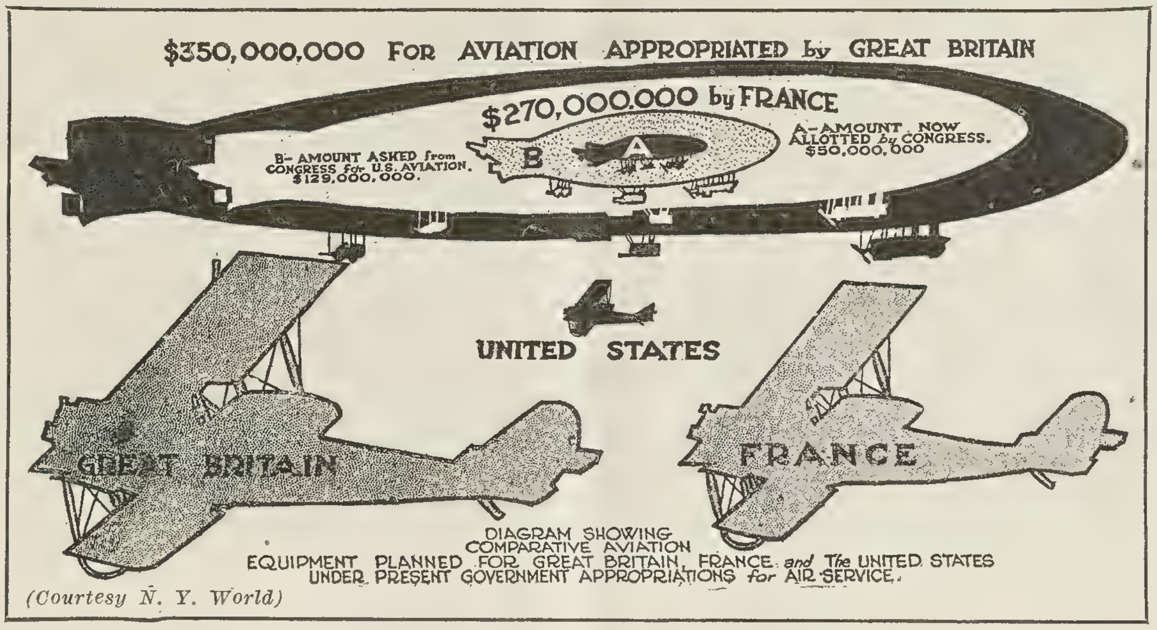
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DIAGRAM SHOWING COMPARATIVE AVIATION EQUIPMENT PLANNED FOR GREAT BRITAIN, FRANCE and The UNITED STATES UNDER PRESENT GOVERNMENT APPROPRIATIONS for AIR-SERVICE.

(Courtesy N. Y. World)

That Congress was informed of the critical position is shown by the statements made by Generals Menoher and Mitchell to the Senate Committee on Military Affairs. General Menoher said in reply to questions by the Senators, “We have really no service equipment as to planes except the De Haviland. It is a pretty good day bomber, it is a good observing ship, but it is not a pursuit ship, and it is not a night bomber, and to properly equip our squadrons we have to have pursuit planes and night bombing planes of the various types to properly equip and carry on the work. Unless we can manufacture adequate equipment we never will get anywhere beyond where we are now. It will be like having artillery without guns, or the infantry without rifles, or the motor transportation corps without trucks. If that program were approved and we were ready to carry it out now we could not have any of those planes probably within a year.”

General William Mitchell followed General Menoher and told the committee with great frankness his opinion of the requirements of the Air Service:

“Now that is what this money is to be used for, and if we do not get some service planes, and if the airplane industry goes to pieces due to lack of work, I do not know how long it will take to get it back, because it was not easy to get it together in this war.

“You have elements in this country now which are excellent. Everything I have seen built in this country is better than any I have ever seen in Europe.

“The Hispano-Suiza motor is a wonder, and our new pursuit planes are wonders too. All they need is to have the ‘bugs’ taken out of them. We cannot depend on any foreign machine. In fact, these foreign machines that are being sent over here are second-rate machines to-day.

“We got this equipment in order to assist us in bridging over the period until we shall have got our own, which will take from one to two years after the money is authorized. The question of materiel is only part of it. We have got to get the personnel trained. Now that is why the $30,000,000 is asked for planes. I think that unless the airplane factories are kept going it will be serious indeed.

“As to lighter-than-air, we ask for less than $15,000,000 to develop dirigibles and keep up our balloons. We have no place in America to make large dirigibles. We have the airplanes, but dirigibles and balloons are more satisfactory for keeping constant surveillance of any point. For instance, if we had them now down on the Mexican border we could keep constant surveillance of everything that was going on.

“Now, we have in there an item of $12,000,000 for experimentation. The Air Service is going along faster than any other branch or arm, and it is something with which, if you fall behind, it is awfully hard to catch up—people get the jump on you—they get the jump on you in making an engine, in every respect. All air services are developing very rapidly. We must keep up this experimentation and get out models for experimental purposes, which, naturally, cost a great deal more than when you can manufacture a great number of the same model. At the present time we have an excellent technical section. I have been struck with the excellency of it. What we must do with the technical section is to give them something to work with. The items I have already covered amount to approximately $45,000,000 (airplanes and dirigibles), and this $12,000,000 for the technical section makes a total of $57,000,000. The remainder of the appropriation is asked for various things to keep the program going.

“We cannot put any ships in service because we have not got the organization nor the machines to put them in service on a basis fit to cope with a nation equipped with a good air service.”

Asked by Senator Thomas his opinion on the advisability of a separate Air Service General Mitchell replied, “In my opinion, after watching these things from over there for practically two years and being connected with it for a much longer time, and considering it not only from a military standpoint, but from the standpoint of availability for civil departments of the Government, and the development of commercial aviation I am convinced that an independent Air Service is the only way in which we will be able to have a good air force.”

Hicks Going Abroad

Aroused by the activities of other countries in aviation, especially in dirigible development, Representative Fred C. Hicks of New York, Chairman of the Aviation Sub-Committee of the House Naval Affairs Committee, announced his intention of going abroad to study what is being done by France and England in developing airships in a military and commercial way.

Mr. Hicks said Congress had not been as liberal as it might have been in making appropriations for aviation in the Army and Navy bill. This was because Congress was not impressed with the plans of the army and navy heads, neither of which, until the bills had become the subject of bitter dispute, had submitted anything that looked to the committees like a comprehensive plan.

The bills as they passed the House carried $30,000,000 for aviation in the Army and Navy. The Senate increased the appropriations for each service to $25,000,000 each, so that for aviation purposes the Administration has $50,000,000 for experiment and development in the next fiscal year. As against this $50,000,000, England's budget for aviation amounts to $303,000,000. Instead of lessening aviation activities as the result of the armistice and peace, England's plans, launched six months ago, provide for extensive airship building with the idea of perfecting machines for ocean travel, as well as powerful battle machines.

Mr. Hicks said he expected to find out, if possible, the extent of England's air program and make a comprehensive report to the Naval Affairs Committee. He believes Congress will not be penurious when it learns what is being done abroad.

Mr. Hicks added his belief that the people of the country were not satisfied with “the way money was wasted in the air program during the war. If there were a reorganization, and an air secretary directing experiments in some co-ordinated way, I think Congress would be more disposed liberally to provide for aviation.”

Permanent Military Policy

First steps have been taken toward drafting legislation to establish a permanent military policy by the Senate Military Committee in the appointment of a sub-committee to confer with the House Military Committee with a view to joint hearings.

Chairman Wadsworth, of the Senate committee, believes that through joint hearings duplication of effort can be avoided and an agreement reached on such matters as universal training, the National Guard and organization of the Regular Army, which will expedite action in Congress.

To Govern World Flying

Principles to govern aerial navigation, already accepted by most of the allied nations, have been made public by the Aeronautical Commission of the Peace Conference, which recently concluded its work. These principles are contained in an international convention which provides for the creation of an international commission.

The principles laid down concern the nationality of airships, certificates of navigablity, rules for flying, lists of forbidden routes, steps to be taken by all signatory nations to develop aerial navigation, various provisions governing the licensing of aviators, equipment of airplanes with signals, distribution of weather reports, and customs regulations.

Airship vs. Airplane in Fog and Darkness

Relative Merits of Both Types Discussed, Showing Advantage to be in Favor of Lighter-Than-Air Craft

By Colonel James Prentice, A. S.

In their descriptions of the trans-Atlantic airplane flights and attempted flights, the participants dwell upon their helplessness in fog and darkness, of the loss of sense of position until they saw the star bombs of Navy destroyers with fixed positions. The Vickers-Vimy crew trusted to sticking to a predetermined compass course, and directional wireless, believing in dead reckoning plus radio assistance, but admitted that once their wireless sending apparatus went out, they were shooting into the dark and keeping up only at a great hazard. Upon arriving, they lost their machine in a swamp which they mistook for a meadow.

Army Airship A-4, Which Has Just Made Excellent Flight

Ask any aviator who was a night bomber or night flier in the great war and you will find that the great problem was to land after returning to his own lines. Landings were mostly matters of chance and luck. Deliberate survey from the air and conversation with ground details were impossible.

Look up the flying records of the airplane flying schools and see on how many foggy days the flying went ahead. Look up the records of the various route reconnaissance trips over the United States and see how many days they were delayed by fog and light rain. See how many of them flew by night over new and strange routes. When you have done so, you will be convinced that the airplane is a clear sky craft which makes night and foggy day trips only at hazards.

Now look up the record of the airship. It considers only high velocity winds blowing contrary to its course and heavy snow or torrential rainfall. Fog, mist, clouds and darkness make little difference. In war time, these are its friends. During the last year of the war, there were only nine days and fifteen night when the little British non-rigid did not operate. And England is a foggy, dark place, up north where the winter nights are long.

The United States Navy flew most of its new airships from Akron, where they were made, to the various coastal stations with new pilots, without any cooperation from places en route, no details waiting with gas and oil, no signals and no beacons except the regular lights of the cities, towns and railways; over the mists of the Allegheny and Blue Ridge Mountains, over the great coastal swamps where the night veils rose and shut off vistas of the rivers and shores. Still there are no reports of concern about them, they invariably brought their ships in all right.

When an airship returns to its hangar, it can give a signal and then wait until a detail reaches the landing pulley to take its rope. There is no hazard of landing, due to fog or darkness. In fact, the more overcast the sky is, the better a balloonist likes it. On overcast days the air does not boil. He is not afraid that a downpour of air will bump his nacelle.

It is in mountainous and densely forested countries especially that time is needed to make landings. Here also there are generally sheets of mist at night. Here the airplane cannot deliver service at night or on foggy days. The small airship can. The chances are that great mining and lumber camps will be obliged to have small airships to bring passengers, mail and express from airplane landing places on the plains outside the forests or the mountains.

In speed the airplane is superior to any airship that can be conceived, but in infallibility to navigate and land in fog, darkness and limited terrain, the small airship is the superior vehicle.

A-4 In Excellent Flight

Starting out from Akron, Ohio, July 11, the army airship A-4, flying against strong head winds, reached Washington the next morning, circled over the city and then proceeded to Langley Field, Va., arriving there late in the evening. Reports to aviation headquarters said the dirigible covered the distance of 407 miles in 18 hours flying time, at an average speed of a little more than twenty-one miles an hour. Lieut. G. W. McEntire was in command of the blimp.

The A-4 is 162 feet long and 33 feet in diameter, and its total cubic content is 95,000 feet. It has a total lifting capacity of 6,460 pounds. She is the first unit of a small fleet of airships which the Balloon and Airship Division of the Air Service has ordered for use in liaison and fire control work, the latter in connection with our coast fortifications.

Allied Air Unity

Cooperation between Great Britain, America and France by the formation of an Allied aviation committee of the League of Nations is now vigorously advocated. The flight of the R-34 airship to America and her return and the enthusiastic reception accorded her by Americans again bring this matter into prominence.

The Atlantic has now been crossed by a seaplane, an airplane and an airship, and it is possible to draw some comparisons between the various types for service. The importance of the establishment of this service is universally admitted, but it is essential that it shall be safe, reliable and financially profitable.

The fact that engine failure in heavier-than-air types necessitates forced landing practically eliminates the seaplane and the airplane for the present from regular passenger carrying across 2,000 miles of ocean. The airship, on the other hand, although suffering from the disability of less speed and difficulty in handling, can remain in the air in comparative safety even though all her engines fail.

Added to which her carrying capacity is greater than either the seaplane or the airplane and will become markedly so at no distant date. The mechanical and engineering difficulties in increasing the size of the airship are considerably less than is the case with the airplane.

It would be a sound policy, it is contended, to invite America's cooperation in the necessary organization and experiments. Much meteorological information is still required and many costly experiments in the construction, handling, loading, embarking and mooring are absolutely essential before the general public can be invited to accept the commercial airship as a regular means of transportation between Europe and America. The committee must be composed of practical men and not theorists, and influence should play no part in the selection of its members.

In addition to the work on the trans-Atlantic airships it would of course cover the whole field of aeronautical experiment and research by allocating various practical work to the air services of the respective countries represented. So far as Great Britain is concerned the initial step is essential before the formation of a committee, namely the transfer of airships from the Admiralty to the Air Ministry.

Seaplane Crosses Alps

The Alps were crossed for the first time by a seaplane July 12. Taddioli, a Swiss aviator, left Sesto Calende, Italy, at 9:30 o'clock and arrived at Geneva two hours later.

The aviator crossed the Simplon and flew over the valley of the Rhine and Lake Geneva.

Navy Mail on Seaplane

Navy mail was brought to New York by air route last week for the first time when a seaplane arrived from Block Island with sacks left there by a destroyer fleet.

The fleet of thirty-four destroyers arrived later and will remain at the torpedo station for a month. The seaplane returned to Block Island with mail for the destroyer Shawmut.

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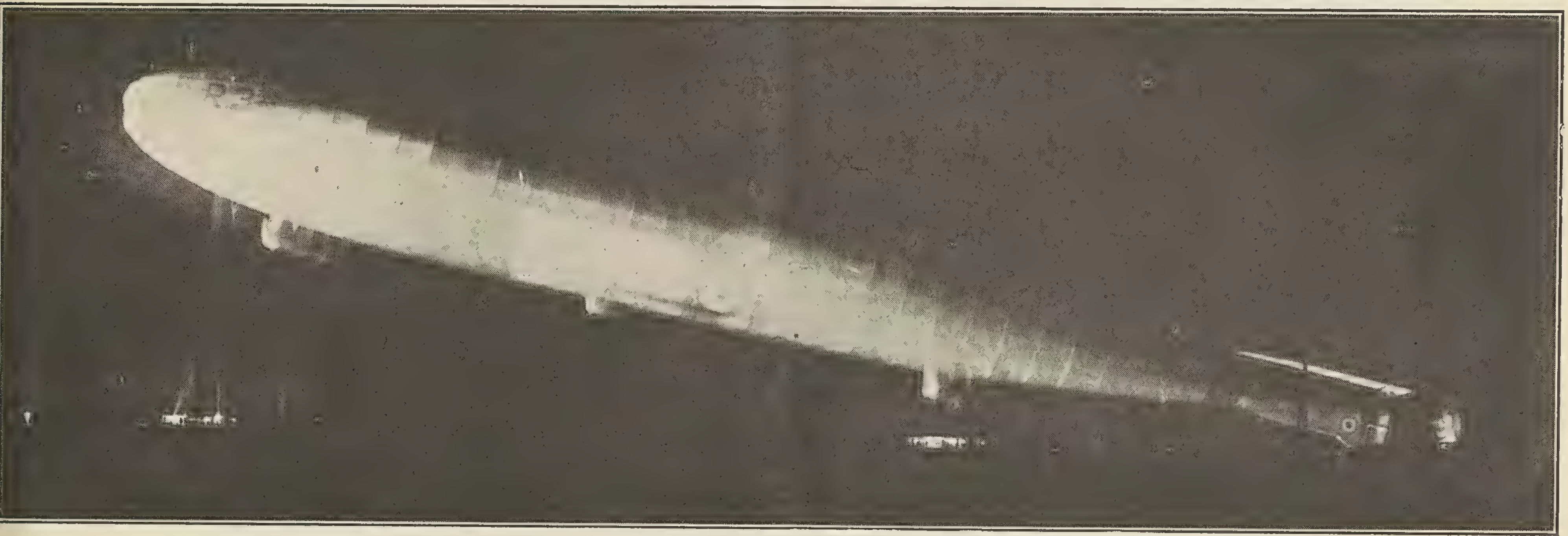
The R-34 Completes the Round Trip

Return Voyage Takes But Seventy-five Hours Despite Disabling of a Forward Engine

Great Britain's trans-Atlantic airship pioneer, the R-34, has completed the round trip between the British Isles and the United States.

Seventy-five hours and a few minutes after leaving Mineola the giant dirigible reached home, landing safely at the aerodrome near Pulham, Norfolk, England. She had completed the first round trip through the air between the Old World and the New, flown more than six thousand miles with but a single stop.

The return voyage was practically without incident, except for the disabling of one of the forward engines which undoubtedly prevented the making of even better time.



SEARCHLIGHTS WATCH R-34 DEPART FROM ROOSEVELT FIELD FOR THE RETURN VOYAGE
International Film Service

Perfect weather prevailed through the last few hundred miles of the journey, and the airship steered a straight course across Ireland by the full moon that materially aided the flyers through the last night of their voyage.

Overseas Record Reduced

Major Scott and his crew are proud of accomplishing the feat so successfully, and they expressed particular satisfaction in having reduced the overseas record which they set on the westward trip by thirty-three hours.

Before landing the R-34 circled over the aerodrome for an hour at a height of 1,000 feet, the shed being sighted by the ship without difficulty.

"Compared with the westward trip, when we experienced adverse conditions, the return was almost without incident," said Major Scott. "I told our American friends we would get home in seventy or eighty hours. It has taken seventy-five hours and three minutes. We learned considerable about winds, and by changing our height we were able to take advantage of them.

"All of us are delighted with the hospitality of New York. Our only regret was that we were unable to remain longer with our American friends.

"Just before reaching Ireland we did six hours at above 5,000 feet, and found it exceedingly cold. We hit Ireland at almost the same spot where Alcock landed."

Colonel W. N. Hensley, Jr., of the United States Army Air Service, acted as pilot part of the time on the way across, standing his watch the same as the British officers. Hensley, when plied with questions, talked as if flying across the ocean were an everyday performance.

The breakdown of one of the forward engines when the dirigible was about half-way across was due to the smashing of a bolt and the mishap almost demolished the crank case.

The ship ran into rain Friday evening that lasted until Saturday morning, but through it all the wireless worked admirably, being in almost constant touch with the Air Ministry, which sent weather reports to the dirigible every few hours.

Frequently the crew were unable to estimate the speed of the ship because clouds and fog obstructed the view of the sea. The average flying altitude was 3,000 feet, but Major Scott rose to 5,000 feet several times during the voyage.

"We were never out of touch with the world, although we met a lot of fog," said Lieut. R. D. Durrant, the wireless officer. "It was hot in New York, cold in the middle Atlantic and you see what it is here. We signalled two ships, the Cumberland and one going to Mexico. When they asked us who we were we said that we were a British airship from New York to England. Their wireless operators expressed surprise. They had been at sea some time and did not know about us."

King George was one of the first to send congratulations to the airmen. All day Major Scott kept receiving telegrams from prominent officials and civilians. The messages began to arrive while the R-34 was still in the air and radio answers went out before the ship reached the ground.

What the Log Says

The log of the R-34 on its eastern trip, as on its voyage westward, was kept by Brig.-Gen. Edward F. Maitland, representative of the British Air Ministry on the dirigible.

The log says that after an extremely good getaway New York looked wonderful at midnight and was a veritable fairyland of twinkling lights. The searchlights at first made a very unsuccessful search "but finally got us fair and square." The great electrical signs of New York, the log says, illustrate the great importance of aerial advertisements.

At a distance of 2,000 feet above New York the air was disturbed, partly because of the heat rising from the city and partly because of an approaching cyclone from the Great Lakes. The airship was very steady under the circumstances.

At 1:10 A. M., Thursday, the R-34 headed for her Scottish base at an estimated speed of seventy-four miles an hour, getting the full benefit of a thirty-five knot wind from the southwest. At 2:17 o'clock the dirigible crossed the American coast line. Four engines were running at that time, while a fifth was being rested.

By 9:15 o'clock Thursday morning the dirigible had covered 450 miles from New York. The mail was then sorted. It included letters for King George, the British Foreign Office, other Governmental departments and a number of newspapers, the log adding:

"We hope this journey will prove the fastest newspaper delivery between NewYork and London yet accomplished and will be the forerunner of a regular interchange of mail between the east and the west—the Old World and the New."

At 10:45 o'clock the R-34 was making seventy-two knots on four engines, the forward engine having been stopped.

Brig. Gen. Maitland, who made the outward and homeward voyage as observer for the Air Ministry, was interviewed by a representative of the *Daily Telegraph*.

"One of the objects of the flight," he said, "was to demonstrate what airships could do in long distance flying overseas with the ultimate view to their commercial use. Airships undoubtedly will be employed for commercial purposes for very long journeys over sea and land. They will not conflict with the airplane and seaplane.

"I want to make that quite clear. There's no question of competition. Airships will make long voyages, and from their terminal airplanes and seaplanes will radiate on short, quick journeys. A commercial company undertaking transport by air will need both types of craft.

"The second object of the voyage was to cement the friendship between this country and the United States. Our reception in America was extraordinarily good and Americans were kindness itself. The American Navy and Army gave us every facility. There is, I think, no doubt Americans were much impressed by the voyage and fully realize the commercial possibilities of the airship. Big airships will be the future carriers of long distance mails and later on of passengers.

"There was no feeling of seasickness on board. On the return trip we had a wind of forty-five miles an hour and a high sea. A surface ship would have been all over the place. The airship's motion was perfectly smooth.

"The landing in America gave an illustration of uses of parachutes in airwork. The parachute, I am convinced, will be used in all air craft but will be of particular value to the airship."

Among the things carried by the R-34 on her return trip were a fragment of the balloon in which Walter Wellman attempted to fly to Europe in 1909, when he was forced down in the open sea 300 miles east of Cape Hatteras; a phonograph presented to the crew by Thomas A. Edison; a letter from President Wilson to King George and several communications to Knights of Columbus officials abroad in recognition of the courtesies shown to the crew of the R-34 by the K. of C. here.

Summary of the Trip

The R-34 started its remarkable voyage the morning of July 2 landing at Roosevelt Field July 6 after a trip of 108 hours and 12 minutes.

The course westward was begun without difficulty and steady progress was made with only three of her five engines in service, despite heavy headwinds that were encountered all along the route. Off Newfoundland these threatened for a time to cause difficulty for the airship, but by skirting the storm to the north Major Scott, commander, succeeded in reaching and passing Newfoundland without mishap.

Continuous battling with adverse winds had, however, depleted the reserve stocks of petrol aboard the ship and by the time the dirigible had passed Nova Scotia and was approaching the Maine coast calls for help began to come out by radio. The United States destroyers Bancroft rushed to the aid of the airship, but after the dirigible got away from the currents near the Bay of Fundy she made better progress and finally succeeded in fighting her way along unaided to her scheduled landing place at Roosevelt Field, Mineola, Long Island, at 10 a. m., July 6.

The dirigible was threatened with disaster within twenty-four hours after her arrival, when strong winds threatened on July 7 to tear her from her moorings. In the course of the struggle to prevent her blowing out to sea, a large rip was torn in the ship's envelope.

Warned about 9 o'clock Wednesday evening, July 9, by Chief Bowie of the Weather Bureau in Washington of an approaching storm Commander Scott made preparations for a quick departure and took the air for the return trip about midnight Wednesday. She headed for New York, and after circling over the city, enveloped in the glare of searchlights, the dirigible passed out to sea.

The R-34, in returning to England from the United States in approximately seventy-five hours, made the voyage twenty-two times as fast as the first sailing vessel to cross the Atlantic. Christopher Columbus, in sailing from Palos, Spain, to San Salvador in 1492 in the Santa Maria, took seventy days.

The American steamship Savannah, the first of her kind to cross the Atlantic, consumed twenty-five days between Savannah and Liverpool. She arrived at Liverpool on July 15, 1819, one hundred years, lacking two days, before the safe return of the R-34 to her homeland. The steamship Mauretania in 1910 crossed the Atlantic from Queenstown to New York in four days and ten hours. The Dreadnaught, one of the fastest and most famous of American clipper ships in the decades preceding the Civil War, made the trans-Atlantic voyage in thirteen days.

The American seaplane NC-4 took fifteen hours and eighteen minutes in flying from Trepassey, N. F., to the Island of Horta, Azores, on May 16. Captain Alcock and Lieutenant Brown in their airplane flight from St. Johns to Clifden, Ireland, on June 14, consumed sixteen hours and twelve minutes.

R-33 Will Fly to India

It is stated that, following shortly the return of the R-34 from America, her sister airship, the R-33, will proceed on a voyage to India. As in the case of the Atlantic flight, the journey already has been made by air, though the first trip, that by a twin-engined Handley-Page airplane, was divided into two stages, with a big interval, while the bomber was engaged in final operations in Palestine.

At the end of last year a big four-engined Handley-Page machine set out to make the journey to India, and owing to various delays on the way did not actually reach her destination until January of this year.

It is probable that the R-33, when she attempts the flight, will make a record run to Calcutta.

Secretary Daniels Predicts

Prediction that the present generation will see the inauguration of regular freight and passenger traffic by air across the sea is made in a letter from Secretary Daniels to the First Lord of the British Admiralty Long, which was carried to Mr. Long on the British airship R-34. The Secretary's letter is in reply to a message of greetings from the Admiralty Chief brought by the dirigible.

"Our country was filled with pleasure at the successful arrival of the R-34, and the Navy of America salutes the British Admiralty," Mr. Daniels wrote. "It is our privilege to live in a day of the fulfillment of many visions and dreams.

"Thank you for your letter, the first that came across the sea in a ship that has conquered the air, the last element left to the conquest of man. We will live to see the day when we will fly across the seas as we have travelled on the trains. Who will prophesy these still greater wonders?

"I congratulate your great empire and its spirit of daring and skill evident in this epoch making flight. It was a delight to welcome your aviators and to find that your men are of stuff greater than their wonderful achievement."

Mr. Long's letter said:

"We take advantage of the voyage of the airship R-34 across the Atlantic to send you a few lines of most friendly greetings. On both sides of the great ocean our hearts are full of thankfulness for the final act which marked the termination of the terrible war, which lasted for more than four years, and we think with gratitude and reverence of the heroic sacrifices of those who gave their lives to save the freedom of the world."

New York-Chicago Mail

The Air Mail route between New York and Chicago was opened for service early this month, when the Eastern half of the route between New York and Cleveland was linked up with the Western half from Cleveland to Chicago which has been in regular operation since May 15.

Mail can now be sent by airplane from New York, leaving there about 5 a. m., and reaching Chicago about 1 p. m. Planes are changed at Belfont, Pa. and Cleveland. The Air Mail arrives in Cleveland in time to catch the plane leaving there at 9:30 a. m. for a non-stop flight to Chicago. About 12,000 letters a day are taken for Pacific Coast points, and through Air Mail service from New York to Chicago will advance the delivery of mail for Seattle, San Francisco, Los Angeles and other cities about 24 hours sooner than if sent from New York through by rail. This applies to letters received in New York post office for the 8:40 p. m. train westward.

Air Mail from the West for New York and points East is taken on at Chicago and Cleveland. A plane leaves Chicago at 2:30 p. m., arriving at Cleveland at 5:30 p. m., in time to connect with the 20th Century Limited, and the mail arrives in New York about 9:00 o'clock the next morning. This gives the business men about three hours more to dispatch mail from Chicago than if sent by train about noon. An airplane leaves Cleveland in the morning at 8:30, taking on all air mail from train connections, and the mail arrives in New York about 1:00 p. m., a stop being made at Belfont, Pa., to change planes.

Most of the planes used are remodelled DeHaviland fours with Liberty motors. They have a capacity of 400 pounds of mail.

Herr Fokker's Dream

Keenest interest is aroused in various circles by a report from The Hague that Herr Fokker, the Dutch inventor of the German battle plane and proprietor of the works that manufactured it, proposes having himself seated in one airplane and towed by another plane. This is the first step toward the creation of an aerial train.

Herr Fokker has a specially constructed monoplane without motor ready for the experiment, but has had great difficulty in getting an airman to man and lead the airplane. A flying train of air cars, some for baggage and some for passengers, is said to be the dream of this Dutch inventor.

Big British Combination

According to the London *Daily Graphic*, a large British airship financial combination, with several millions sterling in money at the back of it, is already well under course of development. This combine, it is stated in authoritative circles, will be heavily subsidized by the governments of the various European Powers, and will be in active operation before the end of the year.

Three distinct types of airships are to be constructed at the works of the amalgamated companies, situated somewhere in the north of England. Airships of moderate size and high speed will carry express and mails and passengers. Passenger liners of large size and high speed are to be made for longer distance flights, and large airships of comparatively slow speed and large carrying capacity are to be constructed for general transport.

Wealthy travelers are to be catered to with small, non-rigid airships maintained at much the same cost as a small yacht.

It would appear that the Vickers will be one of the members of the above combination.

As the *Daily Graphic* proceeds:

"The post-war Zeppelin passenger service from Berlin to Constantinople via Munich and Vienna of late received considerable notice in the German press. Recently, too, the Spanish Government decided to make inquiries into the possibilities of an Atlantic airship service from Spain to the United States. In Britain, the Messrs. Vickers have been no less active in their preparations for a world-wide system of airship travel which in all probability will be in operation before the end of the present year.

"The Vickers passenger airships under contemplation will be of 3,500,000 cu. ft. capacity, will be housed comfortably in existing sheds, and carry fifteen tons of passengers and mails for a distance of 4500 miles at a speed of 60 miles an hour.

"The main airship routes and times of travel in this scheme will be as follows, all voyages starting from London: To New York, 2½ days; San Francisco, 4½; Cairo, 1½; Colombia, 4½; Perth, Australia, 7; Nairobi, 3½; Cape Town, 5½; Rio de Janeiro, 4.

"The British western system, to take advantage of the prevailing winds, will consist of two main lines direct and via Lisbon and the Azores to New York and thence to San Francisco. The London to Rio de Janeiro route will be by way of Lisbon and Sierra Leone.

"The Messrs. Vickers have already announced a provisional fare of $240 per passenger to New York, and mail rates at 3½ pence an ounce."

Cashin Gets His Letter

A packet of letters to Newfoundland officials, the "parachuting" of which from the British dirigible R-34 was recorded by Lieutenant James Shotter, engineer officer, July 4, as the big ship sailed over Fortune, was discovered several miles from Fortune, and the contents of one of the letters from General Seely, Under Secretary of the British Air Ministry, was transmitted to Sir Michael Cashin, Premier of Newfoundland, by telegraph.

Six Rigids for England

Six rigid airships of an improved type, representing successive stages of development, are under construction for the British navy, it was disclosed in the House of Comons by Walter Hume Long, First Lord of the Admiralty.

These airships, he said, would cost $11,000,000.

Albert Vickers Dead

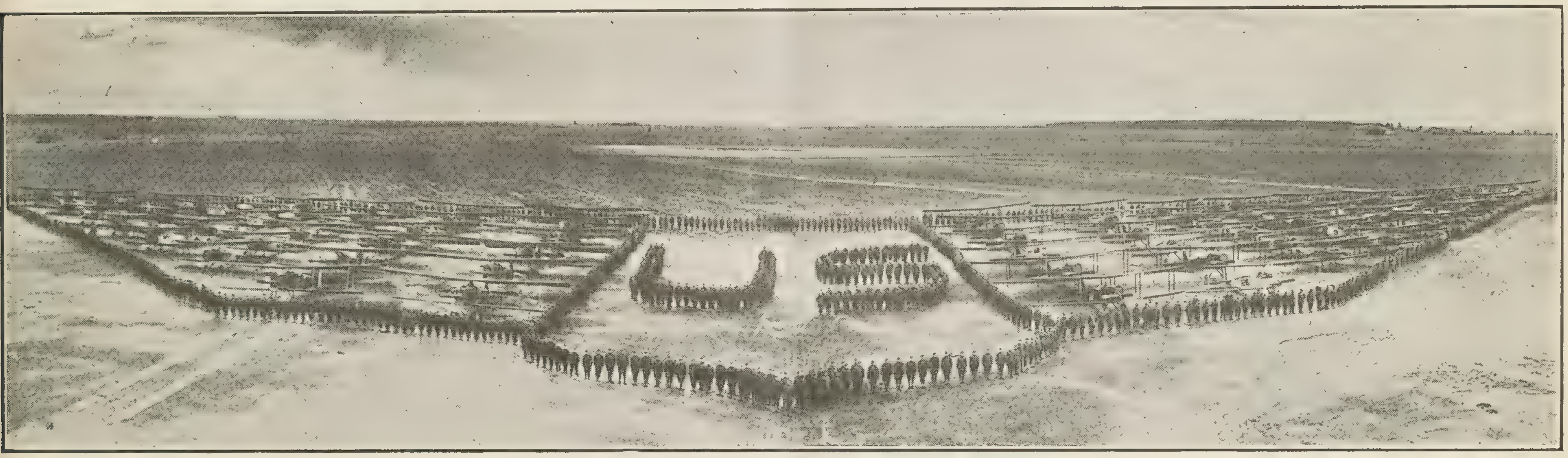
Albert Vickers, one of the leading figures of the steel industry of the world, and formerly chairman of Vickers, Ltd., builders of the Vickers-Vimy-Rolls plane that made the first non-stop trans-Atlantic flight, one of England's greatest steel manufacturing concerns, died at Eastbourne, England, last Saturday. He was 81 years old.

News of the Army and Navy Air Services

Flying Circus Starts

Lieut.-Col. H. B. Clagett left Hempstead, L. I., on the return trip to Texas with his flying circus of seven De Haviland machines. The first stop was made at Washington.

In the leading plane was Colonel Clagett as pilot, with Capt. W. H. Chandler as observer. Behind them came in order, Major J. W. Simmons, pilot, with Sergt. H. H. Altman as observer; Major R. S. Brown, pilot, with Capt. Herman Fluegel as observer; Lieut. J. E. Duke, Jr., pilot, and Sergt. Wayne Wetzell, observer; Lieut. B. H. Adams, pilot, and Sergt. J. C. Smith, observer; Major H. J. F. Miller, pilot, and Lieut. M. J. Plumb, observer; Lieut. R. F. Medkill, pilot, and Sergt. Ralph Kratz, observer.



Second Aviation Instruction Center, A. E. F., France
Prepared by Aerial Photography School.

This flight was in continuation of the Dallas to Boston tour made by these planes which has taken them from their original starting-point in Texas by way of Minneapolis to Boston, New York, and Washington. So far they have covered 3691 miles in 2348 minutes of actual flying time, stopping in nineteen places on the way.

The seven De Havilands composing Dallas-Boston squadron left Dallas May 15 and made the following schedule:

From	To	Miles	Min.
Dallas	Oklahoma	208	105
Oklahoma	Camp Funston	300	170
Camp Funston	Topeka	60	45
Topeka	Kansas City	67	45
Kansas City	St. Joseph and return	80	70
Kansas City	Belleville	285	200
Belleville	Indianapolis	210	145
Indianapolis	Chicago	165	100
Chicago	Milwaukee	80	40
Milwaukee	Minneapolis	300	195
Minneapolis	Milwaukee	375	290
Milwaukee	Indianapolis	260	151
Indianapolis	Dayton	110	65
Dayton	Cleveland	200	122
Cleveland	Buffalo	186	132
Buffalo	Albany	260	150
Albany	Boston	130	66
Total		3276	2091

Average miles 93. 96/100 per hour.

Night Altitude Flight

An experimental flight for altitude at night was conducted at Carlstrom Field, Arcadia, Fla., last week. Lieut. C. C. Chauncey in a Le Pere, with Sergt. Thomas Cook as passenger, reached an altitude of 20,000 ft. without difficulty.

The weather was clear, the wind from the northwest, speed ten miles per hour, and the thermometer in the rear cockpit of the airplane registered five degrees below freezing point. The duration of the flight was eighty-five minutes. The two airmen observed a second sunset.

Directing Artillery Fire

Lieut. Clyde V. Finter, pilot, with Lieut. Robert H. Stell, radial officer, in a Curtiss H, and Lieut. Bernard J. Tooher, pilot, with Lieut. Robert H. Best, radial officer, in a Curtiss H, directed twelve-inch gun fire on a target twenty-six thousand yards at sea from Fort Hancock, N. J., recently.

The flight began at 1.40 p. m. and lasted one hour and fifty minutes. Altitude 4000 ft. Observation very good. Thirteen shots were fired, the first shot two miles from target; later shots bracketed the target at one hundred and forty yards. If the target had been the size of a battleship it would have been completely destroyed.

During the fire Lieut. Eugene H. Barksdale, pilot, with Lieut. Clare F. Young, observer, in a De Haviland, flew at sixteen thousand feet over the target to make a report of visibility of shots from that altitude; visibility excellent. The entire test was considered highly satisfactory.

Demobilization Progress

According to reports received from the Air Service the net decrease in the total commissioned and enlisted strength from the date of the armistice to June 26 was 87 per cent.

The following table shows the present distribution of personnel as compared with the figures of November 11, and the per cent decrease. The June 26 figures do not include 593 officers and 1,949 enlisted men in transit or at demobilization camps awaiting discharge.

	Nov. 11	June 26	Per cent net decrease
Cadets	6,483	54	99
Enlisted men	170,436	21,089	88
Officers	20,852	4,392	79
Total	197,771	25,535	87

The Air Service reports 2,721 active type planes and 2,663 active type engines at U. S. flying fields. Of this number 39 planes and 35 engines, or one per cent, are not in serviceable condition.

De Havilands Assembling

Three of the squadron of six De Haviland airplanes which are to make a flight up the Pacific coast and then across the continent to the Atlantic coast left Ellington Field, Houston, Tex., the air service announced Monday.

They will be joined by three other planes at San Diego and will fly to Seattle before starting eastward.

Non-Stop Speed Record

Captain Lowell H. Smith, flying alone in a de Haviland "Blue Bird," broke the non-stop speed record July 7 between San Francisco and San Diego by flying the distance of 610 miles in 246½ minutes which is at the rate of 148.44 miles per hour.

Cross-Country Flying

The work of the Air Service of the United States Army for the month of June in cross-country flying totals 140,000 miles, but does not include the mileage flying over fields in giving instructions to enlisted men.

Army's Nonstop Record

Announcement has been made that since early in April Army fliers in this country have made eleven non-stop flights, each exceeding 500 miles. The longest was made by Major Theodore C. Macaulay and measured 852 miles. The fastest was made by Lieutenant R. S. Worthington, who covered 500 miles at an average speed of 166.62 miles an hour. In the same period army fliers have made several transcontinental flights and other long flights in which there were intermediate stops of less than 500 miles each. The record of the notable long non-stop flights is:

April 12—Theo. Macaulay and Sergeant A. W. Allman in a De Haviland-4, from Fort Worth, Tex., to El Paso, Tex., 580 miles, in 345 min.; 100.86 m.p.h.

April 14—Theo. C. Macaulay and Sergeant A. W. Allman, in a De Haviland-4, from Tucson, Ariz., to Sweetwater, Tex., 701 miles, in 345 min.; 121.86 m.p.h.

April 16—Theo. C. Macaulay and Sergeant A. W. Allman, in a De Haviland-4, from Fort Worth, Tex., to Americus, Ga., 852 miles, in 415 min.; 123.18 m.p.h.

April 19—Capt. E. F. White and H. M. Schaeffer, in a De Haviland-4, from Chicago to New York, 725 miles, in 350 min.; 133.80 m.p.h.

May 4—Capt. Roy N. France, Major W. H. Frank, Lieutenant Coe, T. E. Gilmore and Lieut. E. E. Harmon, in a U. S. Martin bomber, from Washington to Macon, Ga., 650 miles in 470 min.; 82.98 m.p.h.

May 17—Col. G. C. Brant and Lieut. H. Birkett, in a De Haviland-4, from Houston, Tex., to Belleville, Ill., 720 miles, in 453 min.; 45.34 m.p.h.

May 20—Lieut. G. H. McKay, in a Curtiss JN-4H, from Belleville, Ill., to York, Neb., 500 miles, in 343 min.; 86.04 m.p.h.

June 17—Harvard Rhinehart and J. E. Talbot, in a De Haviland-4, from Dayton to Mineola, 502 miles, in 250 min.; 120.48 m.p.h.

June 17—Lieut. R. S. Worthington, no passenger, in an SE-5, from Palo Alto to San Diego, 500 miles, in 180 min.; 166.62 m.p.h.

June 24—Lieut. G. H. Palmer, Lieut. G. E. Bradford, and five mechanics, in a Handley-Page from Indianapolis to Washington, 505 miles, in 285 min.; 106.26 m.p.h.

July 7—Capt. Lowell H. Smith, no passenger, in a De Haviland Bluebird, from San Francisco to San Diego, 610 miles, in 246½ min.; 148.44 m.p.h.

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Formerly Air Service Journal

The Atlantic an Air Lane

THE safe return to England of the R-34 ends gloriously the pioneers' achievements in crossing the Atlantic. Read, Alcock and Scott will ever remain the three names associated with the conquest of trans-Atlantic flight. Their triumphs will stimulate others to make crossings as Bleriot's channel flight connected aerially England and France for all time.

To gain renown, the next pioneer will have to enter the commercial and passenger field, for it is from there that the practical rewards will come. No further demonstration of the practicability of passenger and mail carrying is now needed. A broad vision on the part of some industrial financier and the nerve of all pioneers, is all that is required to make the Atlantic an air lane of regular voyages.

That Independent Air Force

FEW of the spectators who visited Roosevelt Field to see the R-34 while she was here noted a striking innovation in Army and Navy procedure. Five or six hundred soldiers were at all times attending the big British dirigible but they were commanded by naval officers. The whole thing seemed to work perfectly but enquiry could not bring forth another instance of U. S. Army soldiers taking orders from U. S. Navy officers. It may be that an independent air force would not be as much of a misfortune as some of the naval authorities seem to believe it would be.

"The Battleship of 1923"

IT has been announced that the Navy intedns to lay down a battleship of 43,000 tons to cost $21,000,000. This is just $4,000,000 less than the entire amount that will be available for naval aviation during the coming year *The Sun* of New York in commenting on this "Battleship of 1923" sagely says:

"In many parts of the world men are planning larger, stronger, abler airplanes than those which flew across the ocean, and there seems no reason why they should not succeed. Magnificent as was the performance of the R-34, a British authority has pronounced her model already obsolete.

"With the development of aircraft proceeding at the present rate the question suggests itself: What will be the market value on January 1, 1923, of a first class new battleship with twelve sixteen-inch guns and a speed of twenty-three knots?"

Committee on Aeronautics

THE inefficiency of the present method of securing appropriations for the Army and Navy Air Services is that the estimated requirements are prepared independently and with little regard to the duplications involved. As an instance of this both services wish to erect similar hangars for rigid dirigibles and purchase similar aircraft from the same company in England. The purposes for which these rigids are to be put are identical, as both the Army and Navy wish to use them as a basis for development of an American type. The Navy desires to manufacture its own lighter-than-aircraft, while the Army seems to wish to assist private companies in production.

The duplication of effort again appears in the location of stations along the coast and flying fields in the interior. Little effort seems to be made to avoid placing these fields near together, or with a view to stragetic value.

Much of this waste would be saved if a single committee in each branch of Congress passed on Air Service matters. It will be most fortunate if Senator New's resolution for a Committee on Aeronautic Affairs is favorably acted on by the Senate with as little delay as possible.

Variation of Horse-Power with Altitude

ONE of the most important problems in aeronautics is the variation of engine-power with altitude. The Bureau of Standards in its Altitude Laboratory has recently made a very thorough investigation of this question. This laboratory presents many extremely interesting features in itself, involving as it does a concrete chamber with insulated walls, from which the air may be partially exhausted by means of a blower, thus reducing the barometric pressure within the chamber to a point corresponding to any desired altitude.

Among numerous interesting deductions and results, the following fact stands out as of great interest to engine builders and aeronautical engineers interested in the design of high-altitude military planes, namely that the high-compression engine, while not showing much superiority in power at low altitudes, increases its advantage progressively with altitude.

Thus taking an engine with "high" compression ratio of 5.3 as a standard, the gain in horse-power due to use of an "extra-high" compression ratio of 6.3 amounts to but 2.8 per cent at 5,000 feet, while it increases to nearly 5.8 per cent at 30,000 feet. On the other hand the "low" compression ratio tested of 4.7 showed a falling off of 3.3 per cent at 5,000 feet and 7.3 per cent at 30,000 feet.

When military designers wish to build an altitude machine, it would seem as if they would have to call for the engine with the highest possible compression ratio, in spite of the many drawbacks which such a selection involves.

Armament on the Airplane

IT is interesting to see the increasing part which armament plays in the design of the airplane. Some fundamental principles in this respect are gradually emerging. The forward guns must be perfectly synchronized with the engine, and located in such a way that they can be easily got at by the pilot, and jams easily remedied. The feeds must have ample room and the radii of feed must not be too sharp.

The rear guns must be on a turret which permits angle of fire to be as large as possible. A gun shooting downward must be provided. These principles seem surprisingly easy to follow, yet in rare cases does it occur that the military machine is completed without having to undergo corrections from the armament point of view.

It would seem almost safe to state that the airplane should be designed round the armament, and not the armament supply placed in the plane.

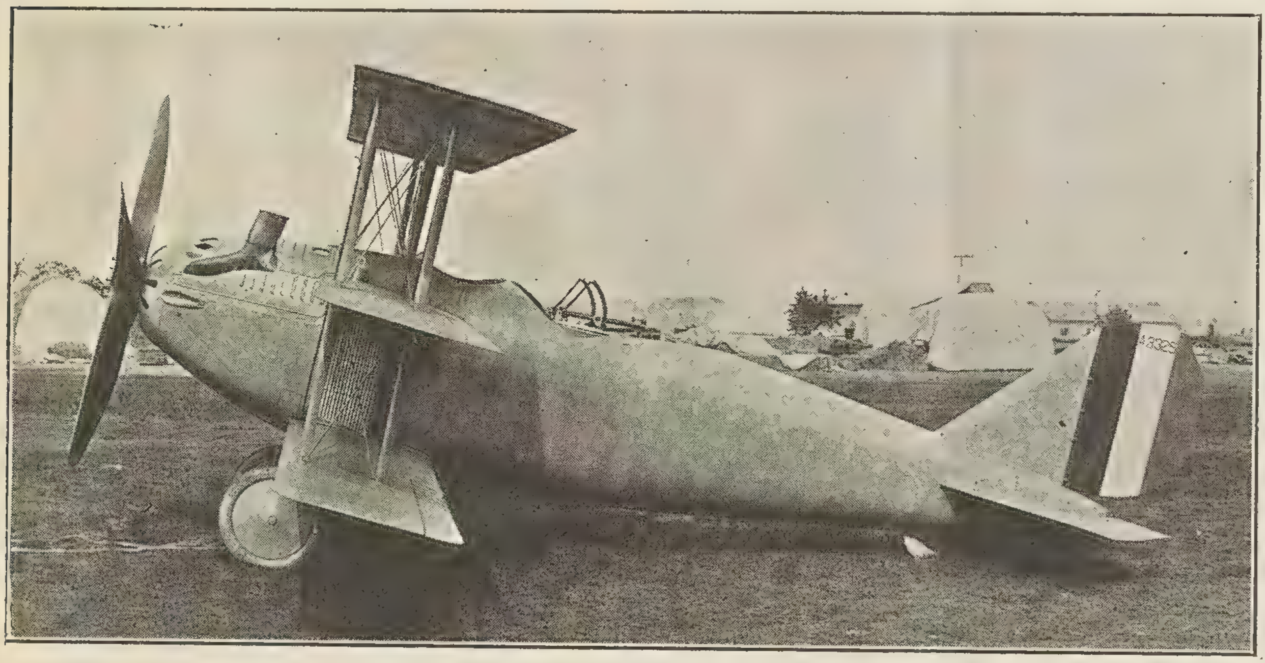
The World's Airplanes and Seaplanes

The Curtiss Triplane—Model 18-T

Excellent streamline with a high power motor is largely due to the success of the Curtiss 18-T triplane. It is very pleasing to the eye and at the same time mechanically and aerodynamically correct. This machine won great popularity through its speed and controllibility and is well recommended by most aeronautical experts.

Power Plant

Model K-12 12-cylinder Curtiss motor.
400 hp. at 2500 r.p.m.
Weight per rated horse-power, 1.70 lbs.



Side View of the Curtiss Type 18-T Triplane

Bore and stroke $4\frac{1}{2}$ x 6.
Weight without oil or water 680 lbs.
Fuel tank capacity 67 gals.
Oil capacity 6 gals.
Fuel consumption per B.hp. per hr. .55 lbs.
Oil consumption per B.hp. per hr. .030 lbs.

Main Dimensions

Span (all planes) 31 ft. 11 in.
Chord (all planes) 42 in.
Gap (between upper and middle planes) 42 in.
Gap (between middle and lower planes) $35\frac{9}{16}$ in.
Overall length 23 ft. $3\frac{3}{16}$ in.
Overall height 9 ft. $10\frac{3}{8}$ in.
Angle of incidence $2\frac{1}{2}$ degrees.
Sweepback 5 degrees.
Wing curve Sloane.
Horizontal stabilizer-angle of incidence 5 degrees.

Areas

Wings, upper, 112.0 sq. ft.
Wings, middle, 87.71 sq. ft.
Wings, lower, 87.71 sq. ft.
Ailerons (middle and lower planes) 21.58 sq. ft.
Stabilizer 14.3 sq. ft.
Elevators (each 6.51) 13.02 sq. ft.
Fin 5.2 sq. ft.
Rudder 8.66 sq. ft.

Main Weights

Net weight, machine empty, 1825 lbs.
Gross weight, machine and load, 2901 lbs.
Useful load 1076 lbs.
Fuel 400 lbs.
Oil 45 lbs.
Pilot and passenger 330 lbs.
Useful load 301 lbs.

Performances

Speed, maximum, horizontal flight, 163 m.p.h.
Speed, minimum, horizontal flight, 58 m.p.h.
Climbing speed, 15,000 ft. in 10 min.
Maximum range at economic speed 550 miles.

The most interesting feature of the Curtiss model 18-T is the plane's streamline. The propeller is practically centered on the fuselage by the location of reduction gears integral with the engine, thus enabling to produce an excellent body streamline broken only by the Scarff ring and gun. The wires are streamline section. The ailerons have a high aspect ratio and are used on the middle and lower planes only. The body is veneer braced by cross bulkheads. The radiators are placed on each side of the body between the middle and lower wings. The propeller, either two or four bladed, is supplied according to requirements of performance.

Fliers Honored

Glenn H. Curtiss was host to Lieut.-Commander A. C. Read, Commander J. H. Towers, Lieut.-Commander P. N. L. Bellinger, the crews of the NC-4, NC-1, and NC-3, and a number of other guests prominent in the development of aeronautics and the success of the American Navy's flight, in the cabin of the "NC-9," constructed for the occasion in the grand ballroom of the Hotel Commodore, New York City.

The time of the banquet was May, 1920, and the "NC-9" and its goodly company found itself on the way from New York to Plymouth, England. This was heralded by a placard aside the gangplank stating "This Plane for Plymouth, England." Along the side were portholes through which could be caught glimpses of a swiftly passing panorama of cloud lands, where occasional flying boats, dirigibles, and other aircraft made their way. At intervals the sea, rippled by the winds through which the "NC-9" drove along, appeared through gaps in the clouds.

A unique construction in the ballroom of the hotel, aided by free use of intricate stage devices, produced an effect remarkable in its realism. When the guests were inside the searchlights played outside, while the land, sky and ocean unrolled before the cabin windows. In elaborate detail the illusion of a luxurious flight to England by the fastest and most thrilling kind of travel was carried out. There was even a stage entertainment on this aircraft in which was performed a fantasia involving a navigator and the sea god, Neptune, and Columbus, the first navigator to make a path between the two continents.

In addition to the commanders of the three NC-boats, the speakers were Admiral Taylor, Major Gen. Charleton, Glenn Curtiss, and John N. Willys.

Each of the guests received a bronze medal commemorating the flight of the NC boats. The medallion was four and a half inches in diameter and was inscribed: "From Glenn H. Curtiss to ———; commemorating the first trans-Atlantic flight, May 31, 1919." On one side it bore the figure of Liberty grasping an airplane propeller in each hand, on the other, an NC plane in full flight above the world, a caravel such as Columbus used appeared dimly in the background. It is illustrated on the cover of this week's Aircraft Journal.

Mr. Curtiss presented a four-foot gold-plated model of the NC boats to the Navy. Mr. Curtiss himself received an oil painting of the three seaplanes on the way across the Atlantic from John C. Willys on behalf of the Curtiss personnel.

Among those present were General L. E. O. Charlton, Air Attache of the British Embassy; Admiral David W. Taylor, Admiral John H. Glennon, Captain Norman P. Hall, Commander Thomas B. Hasler, Commander J. A. B. Smith, C. M. Manley, Dr. A. F. Zahn, F. H. Russell, W. L. Gilmore, F. L. Faurote and Lieut. Commander Jerome Hunsaker. Irvin S. Cobb was toastmaster.

NC-4 on Exhibition

The NC-4, first aircraft to cross the Atlantic, has been placed on exhibition in Central Park, New York City, where it is viewed daily by thousands of admirers.

The fuselage and wings of the NC-4 were brought over on the deck of the U. S. S. Aroostook, while the engines were stored below deck. Under instructions to proceed to this country with the greatest care in order that nothing might happen to the historic plane, Capt. Harry Tomb, U. S. N., commander of the mine layer, took a southern course to America, which brought the Aroostook within 100 miles of Bermuda.

The Aroostook, which was the Bunker Hill before the war, plying between New York and Boston, was in the harbor of Plymouth, England, at the time the NC-4 arrived. She left Europe with the flying boat on board on June 21.

Aero Club Luncheon

The commanders and crews of the NC planes were entertained by the Aero Club of America and the Queensboro Chamber of Commerce at a luncheon given in the Waldorf-Astoria July 10. A large number of members were present and the crews of the Navy's trans-Atlantic planes were presented with medals.

Secretary Daniels and other prominent officials sent telegrams of congratulations to the aviators, expressing regret at the inability to be present to personally pay their respects.

Todd Loses His Seaplane

The series of misfortunes which attended the plan of Professor David Todd, of Amherst College, to take observations of the solar eclipse on May 29 culminated at Pernambuco, Brazil, June 29, in the destruction in a severe storm of the naval airplane.

Passenger Flights on Long Island

Passengers are carried in flights from the Queens Village Airdrome, Queens, L. I., by aviators D. C. DeHart and G. C. Budwig, civilian flying instructors during the war and former fliers of the U. S. Air Mail Service. Curtiss machines are used.

$50,000 Prize for First Trans-Pacific Flight

Motion Picture Magnate's Offer Rivals That of "Daily Mail," Won by Alcock and Brown

Thomas H. Ince, prominent in the motion picture world, has offered a prize of $50,000 to the first aviator to fly across the Pacific Ocean. The announcement of Mr. Ince's offer rivals the publicity attendant upon the prize of £10,000 given by the *Daily Mail,* of London, to Alcock and Brown for their non-stop flight across the Atlantic.

No Publicity Attended the Signing of the Check

Mr. Ince's check for the prize money is now in the hands of Mayor A. E. Coles, of Venice, Cal.

Mr. Ince, in the official summary of "Rules and Regulations for the Thomas H. Ince Trans-Atlantic Flight," states that the prize shall go to the aviator who shall first complete an aerial voyage across the Pacific Ocean, in a heavier-than-air machine, mechanically propelled, of any size and type. The flight may be attempted from either side of the ocean, but if westward the starting place must be from the Thomas H. Ince Aviation Field at Venice, California, or the Thomas H. Ince Hydro-Airplane Station, at Venice, California, and the finish must be on the mainland of Australia, or the mainland of the Japanese group of islands, or the mainland of the Philippine group of islands or the continent of Asia; if eastward, the mainland of the Japanese group of island, or the mainland of the Philippine group of islands, or the continent of Asia, and the finish must be on the mainland of the United States of America. The course of the flight must be confined to latitudes 49 degrees, north and 32 degrees, 33 minutes, north, of the United States of America, and latitudes 41 degrees, 35 minutes, 20 seconds, north and 38 degrees, 45 minutes, south of the Eastern Pacific.

The contest shall be confined between the months of September, 1919 and February, 1920, inclusive, and contestants must complete the trans-Pacific flight within 288 hours from the time of starting.

In the event that no contestant shall successfully complete the trans-Pacific flight, for which the sum of $50,000 has been officially offered, the contestant starting from the Thomas H. Ince Aviation Field at Venice, California, or the Thomas H. Ince Hydroairplane Station at Venice, Cal., who shall have reached the Hawaiian Islands in the shortest length of time, shall be awarded the sum of $10,000; and in the event that no contestant shall complete a flight to the Hawaiian Islands, the contestant starting from these who shall fly the furtherest in the direction of the Hawaiian Islands shall be awarded the sum of $5,000 dollars.

The contest is open to persons of any nationality holding an aviator's pilot license issued by any accrediated aero club affiliated with the Federation Aeronautique Internationals, or to persons so rated by any military or naval establishment.

The entry form, which must be accompanied by the entrance fee of $500, must be sent to the secretary of the Pacific Aero Club, Monadnock Building, San Francisco, at least fourteen days before the entrant makes his first attempt. No entrance fee will be required of any military or naval contestant.

No part of the entrance fees are to be received by Thomas H. Ince. All entrance fees will be applied toward payment of the expenses of the Pacific Aero Club in conducting the contest. Any balance not so expended will be refunded to the contestants pro rata.

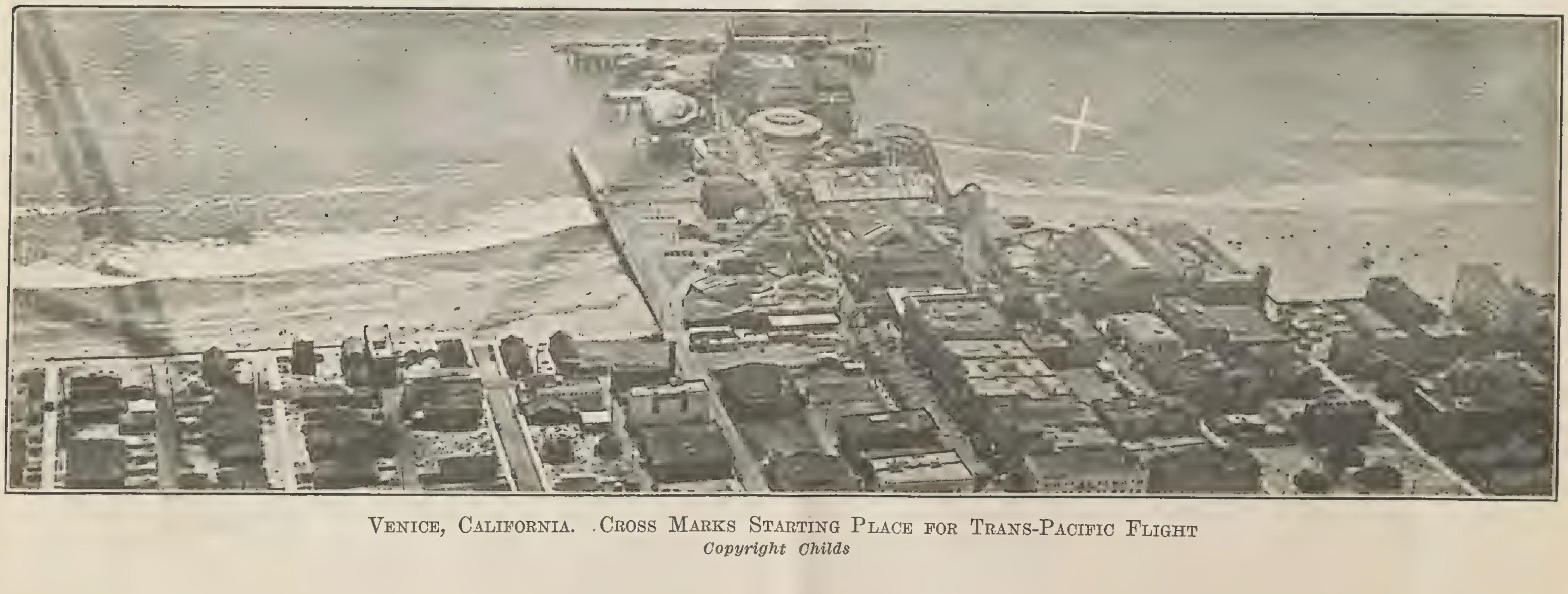
The start of contestants may be made from land or water, but in the latter case, the contestants must cross the coast line at the beginning and end of flight. The time will be taken from the moment of leaving the land or crossing the coast line. All starts must be made under the supervision of an official of the Pacific Aero Club.

Flight Across State

Roland Rohlfs, experimental pilot for the Curtiss Aeroplane Motor Company, flew from Buffalo to New York last week in a Curtiss Oriole three-passenger plane in 5 hours and 2 minutes, thus making the trip in almost half the time of the Empire State Express.

From Buffalo to Albany Rohlfs averaged 100 miles an hour. Below Albany, where cross winds were encountered, the speed was reduced to sixty miles an hour.

The flight was made for the purpose of carrying to New York in time for the dinner given by Glenn H. Curtiss to the commanders of the trans-Atlantic planes at the Commodore Hotel, 200 copies of a history of the flight which were printed too late to catch the train from Buffalo.



Venice, California. Cross Marks Starting Place for Trans-Pacific Flight

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Delivering Naval Aircraft by the Air Route

How the Naval Aircraft Factory Has Conducted "Fly-Aways" Totaling 15,000 Miles—Advantage of Air Delivery

By S. T. Williams, Assistant Chief Engineer

By delivering planes in the air instead of by rail, the Naval Aircraft Factory, Philadelphia, has saved the Government approximately 280 plane days; an expense of $50,000 and in addition released freight cars to a total of 309 freight-car days.

Preparing N-9 Seaplane for Delivery by Air
Photo Naval Aircraft Factory

In all, 33 seaplanes were delivered by air in the past 17 months—the delivery distance varying from 2200 miles to Pensacola; 350 miles to New London and 300 miles to Hampton Roads Naval Air Station. Planes in flight delivery totaled 15,000 miles; and but one unit was crashed.

The trip to Hampton Roads is by far the most common, taking on an average of 3 hours and 10 minutes as against 9 days for a freight shipment, and to this must be added the time of setting the plane up and disassembling it again.

This, in brief, summarizes the experience of the Naval Aircraft Factory in delivering planes by air. Back of this lies the organization, system and careful inspection that made this record possible.

The first advantage of flight delivery is that highly trained personnel and efficient production methods may be applied to flight preparations. The hull assembly, comprising engine installations complete, tail assembly, etc., are completed by production workmen in the final assembly shop—and transferred to the hangar ready for the panels. The panels are jigged and set up in a similar manner and sent to the hangar ready for attachment to the unit. Here the unit is assembled by experts, passed by the various inspectors and launched.

Upon launching, the unit is turned over to an enlisted crew, which is part of the hangar organization. This crew gives the engines an initial tryout and a trial flight is made. Reports are made on the action of all parts and no units are released until correct in every detail.

Prior to the flight of each unit, the Weather Bureau and various air stations en route are consulted with reference to the weather conditions. When leaving all air stations are advised as to the time when the plane should pass or arrive. Adverse conditions—rain, fog or exceedingly high wind—alone prevent flight, and in the past 17 months there have been but two months in which flight delivery was impossible. Those were February and March, 1918, and few stations desired planes at that time.

The Delaware River at the Naval Aircraft Factory offers an ideal seaplane base and testing station. Two routes are open to safe seaplane flight to the ocean. One is directly down the Delaware, a distance of 95 miles, to Cape May, and the other overland to the Chesapeake, and down it to Hampton Roads and the ocean.

Air View of Old Naval Aircraft Factory Hangar
Photo Naval Aircraft Factory

The former route to Hampton Roads is usually chosen by the larger seaplanes; the smaller preferring to follow the Delaware Canal overland, and inside water down to Hampton Roads.

The longest "flyaway" was made by three H-16 units (twin Liberty-motored tractor biplane seaplanes of 95 ft. span and total weight of 10,500 lbs.), in October, 1918, to Pensacola, Fla. The distance is 2200 miles, and it was made in 23 hours' flying time—air average of 95 miles per hour. The elapsed time was 8 days, with but one idle flying day and but one false start.

Most of the seaplanes were flown to Hampton Roads Naval Air Station, Va., and the time required is from three to four hours. The freight shipment time is about 9 days—the air delivery hence netting a total saving of 8 days per unit. The cost of packing at the factory, or assembling for flight are about the same, and the cost of flight is approximately equal to the freight charge. But in either case the unit must be assembled, and it is the cost that is saved. In addition the release of freight cars; earlier time seaplanes are available, and assembly of units under most favorable conditions are to be considered.

The success and practicability of this method of delivery is evident, and is eloquent of the future commercial success of the aeroplane.

From U. S. to Canada

Armed with the first permit ever granted by the Canadian military authorities for an airplane flight across the intenational boundary, two American aviators arrived at Montreal last Sunday from New York State.

The visitors, Lieut. O. S. Parmer and Ensign G. D. Garmon, flew from the Junior Camp at Plattsburg, N. Y., covering forty-five miles through a heavy rainstorm in fifty minutes. The plane was flown back to Plattsburg by Major H. M. Hobbs and Lieut. Thomas Phillips.

Aerial Cops Busy

New York's air police are making daily flights over the waters adjacent to the Battery in search of "river pirates."

Big Hangars for Navy

The Navy Department is soon to start the construction of two of the largest airship hangars in the world. Authority for the construction is granted in the new naval appropriation bill.

Rear-Admirals Taylor and Parks, heads of the bureaus of construction and repairs and yards and docks, respectively, have instructions to speed up preparation of the working plans, as an expenditure of about $3,500,000 for two hangars to house flying machines of the Zeppelin type has been authorized. They will be located on the seaboard, probably in New Jersey, and possibly on the same site.

Ground area necessary for construction of a double hangar will be about one square mile. Each hangar will be about 800 ft. long, 250 ft. wide and from 150 to 200 ft. high. It is probable that all steel construction will be used, and officials estimate that from six to eight months will be needed for their erection.

Provision for the purchase abroad of a Zeppelin type airship at a cost not to exceed $2,500,000 is made in the naval bill, and the construction in this country of a similar machine, at a cost of $1,500,000.

It is probable that the machine purchased abroad will be of the British R-34 model, although larger. It probably will be flown to this country by an American crew. Negotiations looking to the purchase have been entered into with foreign nations.

Air Mail Records

A record of 99 per cent was made by the Air Mail Service between Washington and New York for the month of June, covering a mileage of 11,118 and carrying 15,643 pounds of mail.

On the Cleveland-Chicago division a perfect score of 100 per cent was obtained. A total of 19,825 miles was run during the month of June on that division and a total of 19,603 pounds of mail was carried. The average speed on that route for the month was 97.8 miles per hour. The best flying was performed on June 18 when the round-trip from Cleveland to Chicago and return was made in 6 hours and 14 minutes—an average of 104.4 miles an hour in each direction.

The operation of the Cleveland-Chicago route is without a parallel in the history of aviation. The route was started May 15 and has never missed a day—70 consecutive, daily, non-stop flights of 325 miles each were made without a forced landing. On the 71st trip a gas line connection sprung a leak causing a forced landing on the emergency air mail landing field at Bryan, Ohio.

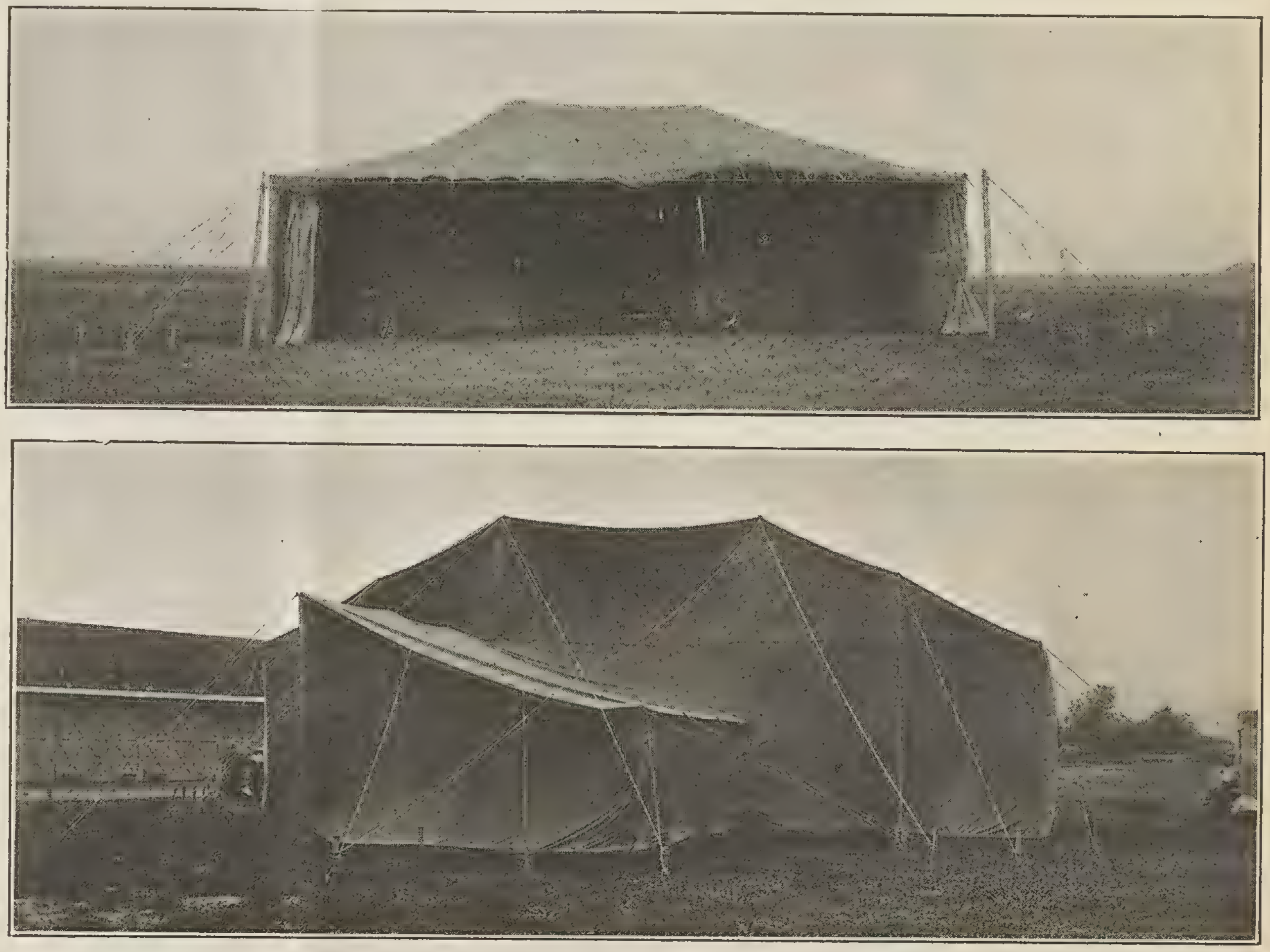
On July 4th there were on the mail route between Washington and New York, New York and Cleveland and Cleveland and Chicago, ten planes in flight. The shortest route was 215 miles from New York to Bellefonte, Pa., and the longest route was from Cleveland to Chicago or 325 miles. All ten planes scored 100 per cent, arriving and leaving every station on time.

Radio for the Air Mail

The Post Office Department has contracted for three radio stations, the first of a chain of wireless communicating centres in various cities to be used primarily for the direction of mail-carrying airplanes handicapped by fog, it was announced in Washington July 10 by Emil J. Simon, manufacturer of radio apparatus.

Portable Canvas Hangar

Severe tests of a newly designed portable hangar for airplanes have been made during the past week at the U. S. Flying Station at Hazelhurst Field, Mineola, L. I., under the supervision of Major J. E. Rossell, Engineering Officer of the Army Air Force stationed there. The hangar, which is manufactured by Foster & Stewart Company, of Brooklyn, was erected in a gale of wind, and rode out a heavy rain storm.



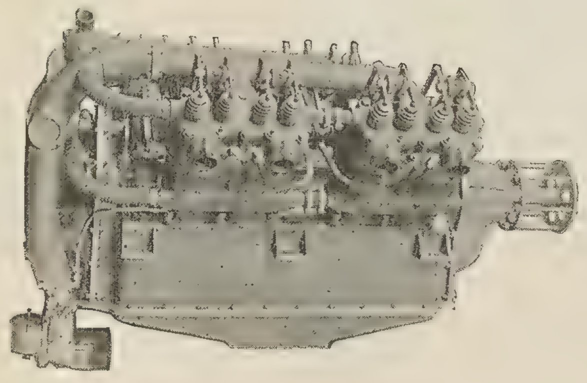
FRONT AND REAR VIEW OF NEW CANVAS HANGAR

Since aviation became a scientific demonstration instead of a theory, it has been the endeavor of aviators and engineers to construct a portable hangar that would combine ample working space without waste of material, strength of wind resistance sufficient to withstand storms even when they approach cyclonic velocity, and ease of egress and ingress.

As a result, Foster & Stewart Company, of Brooklyn, has demonstrated that it is prepared to make for aviators a wind-proof hangar that easily can be transported from field to field, and quickly can be erected by the crew of the machine it is built to protect. These hangars are standardized for the various makes of planes.

The width of the hangar is 51 ft., allowing 3½ ft. on each side to the tips of the plane. The walls of the main body of the tent are 12 ft., allowing ample clearance space for the ingress and egress of the plane, yet making the highest point of wind resistance only 13 ft. At this point the hangar is protected by a double set of guys which are built into the tent, and which criss-cross themselves in a manner to balance the strain, no matter from what direction the wind may blow. There is nothing to unfasten or to become unfastened, as these guys, passing as part of the top completely over the hangar, are fast to the rings the poles go on. The extension to accommodate the fuselage is of ample size to allow working room, and is designed at an odd slant to shed wind and water, and this is guyed just as substantially as is the main body of the hangar.

When the tent is up the front wall is as tight as a drum, but is attached to a cable at the top, and can be opened from the center, portiere style, for the ingress and egress of the plane. When closed, these center pieces are lashed together, making it to all intents and purposes one continuous piece of canvas. Iron pegs at the bottom secure the front to the ground.



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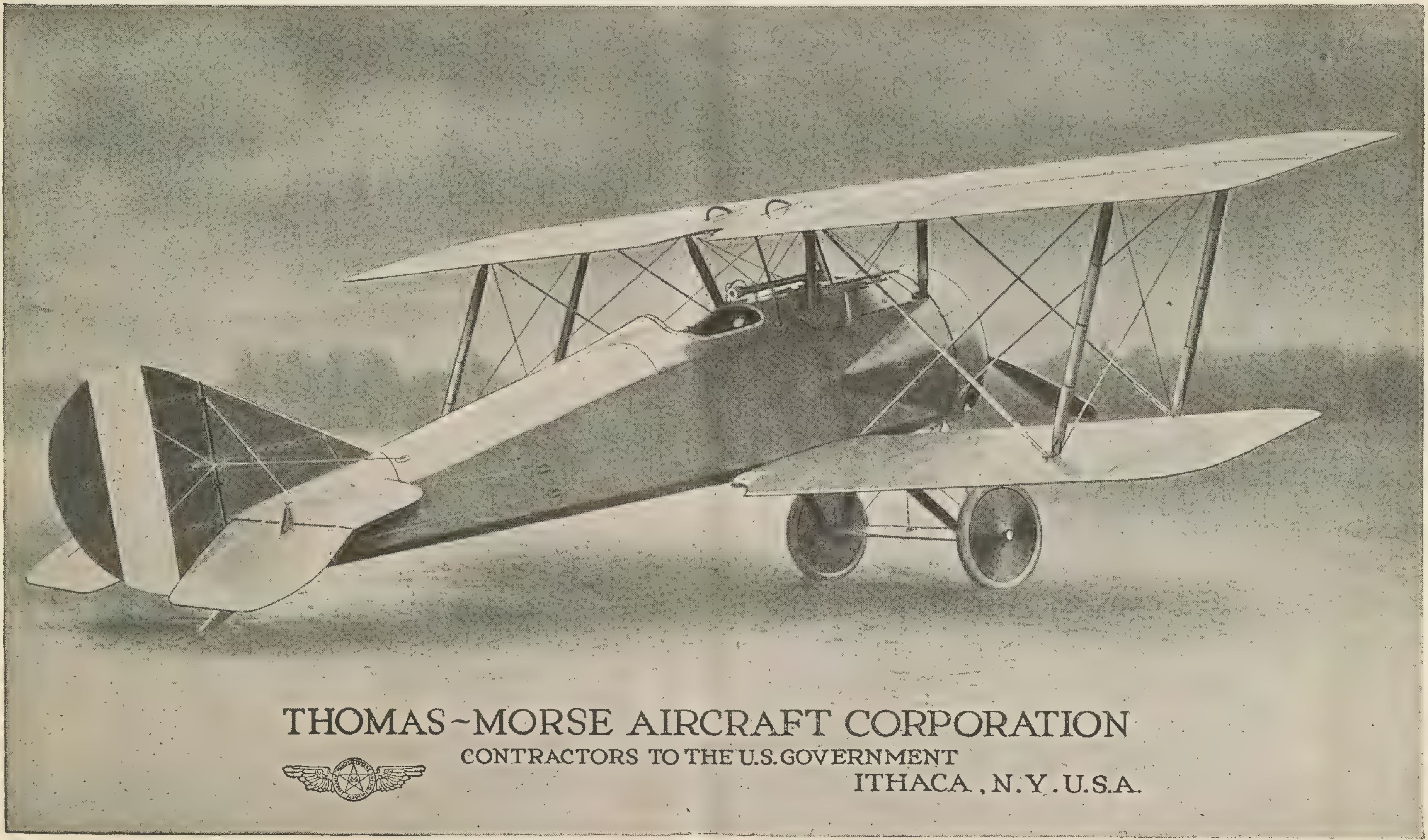
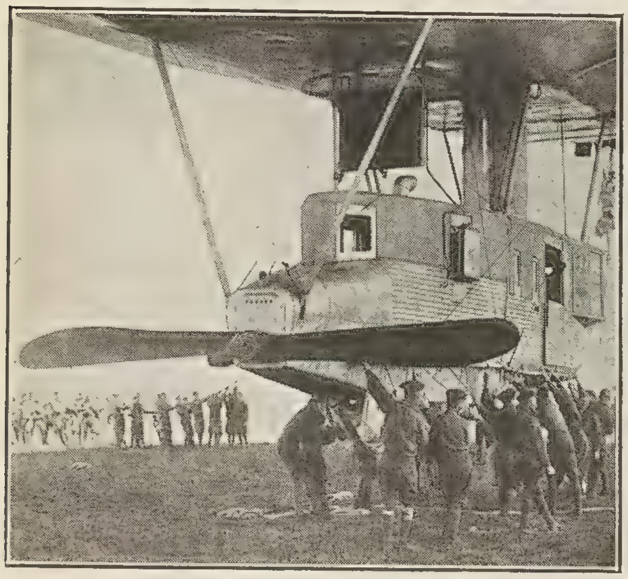


THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
ITHACA, N.Y. U.S.A.

Valspar on R-34 Propellers

The propellers of the R-34, Britain's great airship which successfully made the return flight across the Atlantic, were varnished with Valspar by a special staff from the Valentine and Co. factory during the time of its brief stay at Roosevelt Field.



An R-34 Propeller, Showing Huge Size
Photo Edwin Levick

The varnishing of the propellers, which had become covered with layers of grease and oil on the eventful trip across, was quite a task, for due to the high wind the giant ship swayed so that the varnishers were kept on a dog trot to follow the path of the fore-and-aft propellers. To reach the two propellers under the center gondolas it was necessary, with the aid of an Army lieutenant in charge of the Fire Department of the field, to rig up a moving scaffold, which was guided by a detail of twenty soldiers while the men worked on the finishing.

Valentine & Co. have also achieved the distinction of being the first to deliver a shipment of varnish by airplane. Recently aviators B. Lockwood and E. K. Merritt—both former Army fliers—left the Valentine factory on Long Island for a flight of 100 miles to Allentown, Pa., making the trip in 75 minutes.

While officials of the company have declared to a representative of Aircraft Journal that they have no intention of establishing a regular airplane service at this time, still they propose to adopt it promptly when the demand for speedy delivery of varnish makes the step commercially advantageous.

The plane which made the initial delivery was itself varnished with Valspar, and the excellent condition in which it reached Allentown is worth noting, inasmuch as the machine flew through no less than fifteen rainstorms on its trip.

Record for Single Motor

Cables from France announce that the recent non-stop flight made by the French aviators Roget and Coli from Paris to Rabat, Morocco, a distance of 1116 miles, constitutes a world's record for a single-motored plane, their machine being driven by one 300 hp. Renault engine.

Try for Parachute Record

Lawrence Sperry will try for an altitude record in jumping from an airplane in a parachute at the first New York Police Field Day at Sheepshead Bay, July 19. A number of aviators from Hazelhurst, Roosevelt and Mitchel Fields will engage in acrobatic flying for the immense crowd expected.

Delivering Valentine's Valspar by Airplane
Photo Underwood & Underwood

THE AEROMARINE PLANE AND MOTOR COMPANY

Will Specialize in Filling the Individual Requirements of

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—and—
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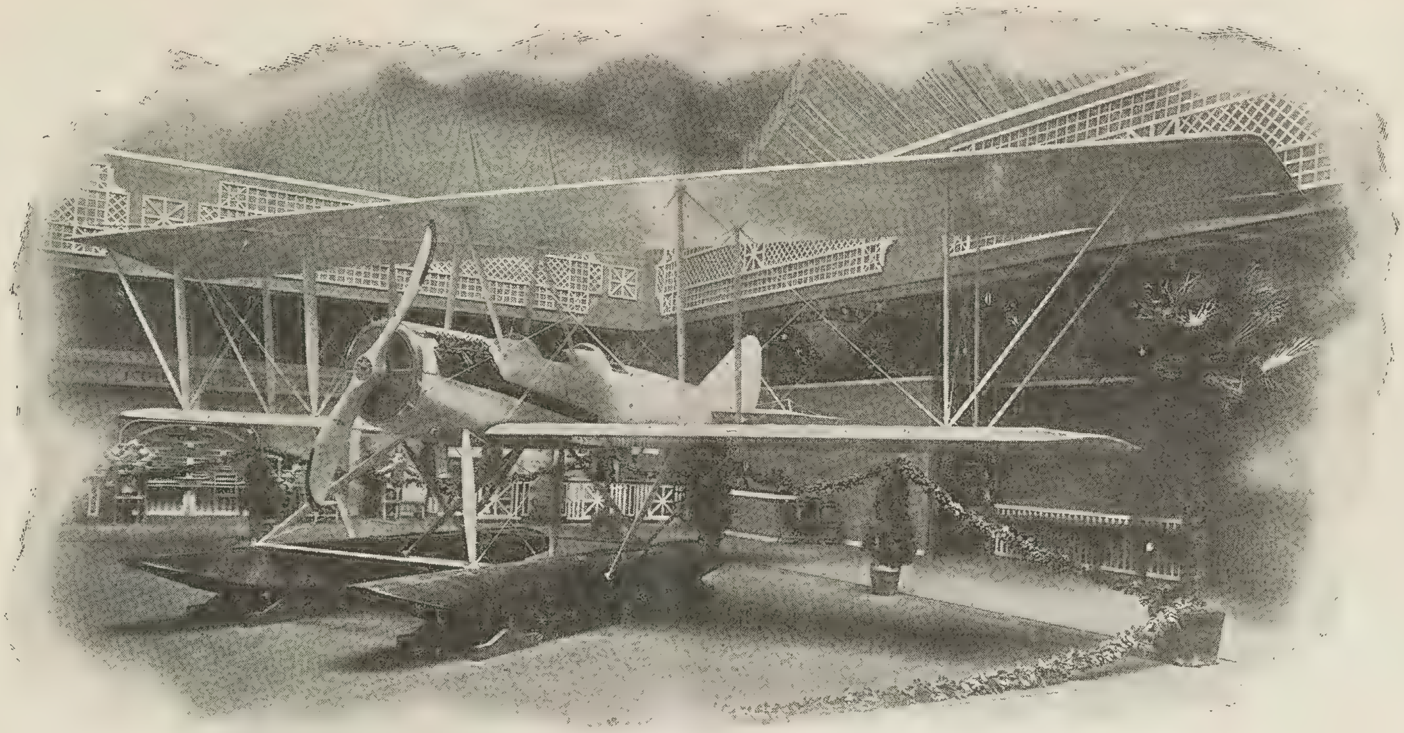

"THE SEAGULL"—Sport Seaplane

L-W-F ENGINEERING COMPANY, Inc.
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The Atlantic Flight

Made possible on schedule time by

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When Other Propellers Failed

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SAVED THE DAY

The new Paragon Booklet, Technical and Historical, free for the asking.

AMERICAN PROPELLER & MFG. CO.
BALTIMORE, MD., U. S. A.

Exploring by Air

Four Canadian training airplanes are scheduled to leave for Labrador soon for the purpose of exploring, photographing and mapping approximately two million acres of forest in the territory tributary to Battle Harbor. This is the first time such a trip has ever been attempted, and it is said the work will be completed in six weeks. Without the use of the airplanes at least three or four years would be necessary to accomplish the same results.

Standing—Lieut. W. S. Cormack, Pilot Ensign Wm. Beehler, in Charge of Mechanics; Jack Ward, in Charge of Motion Picture Operation; Ensign Wm. P. Smith, Pilot. Seated—Dr. H. Tiss, Medical Officer; Captain Daniel Owen, in Charge of Expedition; Dr. M. N. Graham, Surgeon

Photo Ward Studio

The expedition will leave Annapolis, Nova Scotia, by boat for Battle Harbor, Labrador, where a base will be established. From here the airplanes will depart in pairs for daily trips over the forests, taking photographs with aerial cameras of the same type that were used during the war. These photographs, showing the density of the forests, together with the data secured by the surveyors, will form a basis from which accurate costs and length of time of development work can be estimated.

By the use of the wireless telegraph, the expedition will be able to keep in touch with their offices in Boston, and daily reports of the progress will be made. The project, which is financed by a syndicate of Boston bankers, is headed by Captain Daniel Owen of the Royal Air Force. The other pilots are returned American Army and Navy aviators, all of whom have definite war records. In addition to the pilots and mechanics will also be wireless operators, surveyors, a surgeon, a naturalist and a photographer.

The entire equipment, including the airplanes, wireless outfits and aerial cameras were purchased from the United Aircraft Engineering Corp., of New York, the concern that recently purchased the entire flying equipment of the Royal Air Force of Canada, the original value of which was close to $10,000,000. Several hundred of these Canadian training planes have already been sold, and reports indicate that in almost every case they are being used for commercial purposes.

American Handley Page Co.

The American Handley Page Company, with headquarters in Ogdensburg, N. Y., was incorporated June 17 "to establish airplane routes within the United States to carry passengers and merchandise," according to the certificate of incorporation filed at Albany. The capital stock is $5,000,000. The directors are: William H. Workman, New York; Harry Clark, Montreal, and Julius Frank, Smith L. Sawley, and Cecil Brownlow, all of Ogdensburg.

Catches Ocean Liner

Chartering a seaplane to catch the steamer Kaisha Maru, which he missed when the vessel sailed from Seattle for Oriental ports to-day, J. J. Mayer, Seattle Red Cross worker, booked for Vladivostok, succeeded in boarding the ship near Port Townsend, Wash., after a thirty-five minute flight.

Mr. Ware is Married

The marriage of Raymond Ware, secretary of the Thomas-Morse Aircraft Corp., of Ithaca, N. Y., to Miss Catherine Munro Schurman, daughter of Pres. J. G. Schurman of Cornell University, was solemnized in Sage Chapel of the university Saturday afternoon, July 12.

During the ceremony a squadron of Thomas-Morse planes soared over the chapel. Dr. Henry Van Dyke, of Princeton, N. J., officiated.

MERCHANTS FIRE ASSURANCE CORPORATION OF NEW YORK

AVIATION DEPARTMENT

Is now issuing policies covering the following hazards to aircraft:

1. Fire and Transportation
2. Collision (damage sustained by the plane itself)
3. Property Damage (damage to property of others)

Additional coverage may be had against loss by windstorm, cyclone or tornado.

Austen B. Crehore, Manager, Aviation Department.
For two years pilot in Lafayette Flying Corps
and previously with this company since 1910.

We should be glad to discuss with those interested the various phases of insurance on Aircraft.

MERCHANTS FIRE ASSURANCE CORPORATION OF NEW YORK

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Flier wearing Magnavox Anti-Noise Equipment

MAGNAVOX ANTI-NOISE TELEPHONES

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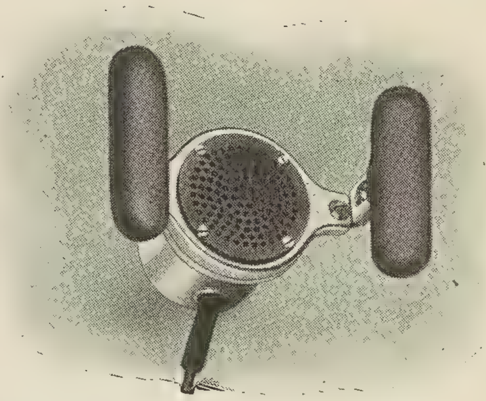


The U. S. Navy Standard Type of Anti-Noise Airplane Transmitter—now released from war secrecy restrictions.

Last Word in Efficiency for Airplane Intercommunication or Radio-Telephony.

The U. S. Army and Navy took our entire output during the war—and, naturally, our entire plant operated behind a heavy curtain of secrecy. Now the war is won, the veil is lifted, and commercial aviation may profit from our historic wartime developments. If you fly, you should investigate our apparatus.

The Navy's "NC" Planes

that crossed the Atlantic were equipped with Magnavox Anti-Noise telephone apparatus. Read what Acting Secretary Roosevelt said of its performance, as quoted in the Electrical World for May 24:

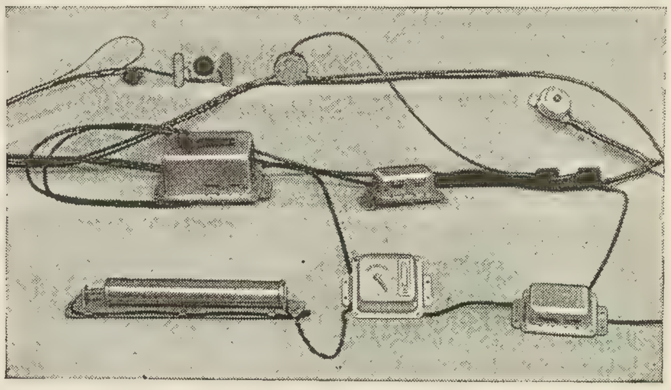
A special feature of the telephone sets is *the anti-noise microphone,* which is so constructed that *the engine noises are not heard.* This is accomplished by having the back of the microphone open. The exterior sound waves strike the back as hard as the face of the diaphragm, and therefore the effect is neutral. The voice waves strike only the face of the diaphragm, and even though the operator cannot hear his own voice, the radio sets receive enough effect to modulate the transmitted wave.

"*This single item has been the deciding factor in success or failure in long-distance transmission by telephone by airplanes.* It is easy enough for short distances to get communication with an ordinary microphone, but for long ranges it is *impossible without the anti-noise transmitter.*

"Using *the same intercommunicating telephone system,* the navigator can telephone to the pilots, giving them the proper direction in which to steer the plane. He may inquire of the engine room regarding the condition of the engines, or *he may hold radio-telephone conversation with the navigating officer on one of the other planes.*

"In other words, the intercommunicating telephone makes possible constant communication between all members of the crews *in spite of the terrific noise caused by the engine* and the wind rush, and in spite of the fact that they are in separate parts of the seaplane. In addition to this the radio telephone makes it possible for the commanding officer and navigators to *talk directly with each other, although their seaplanes may be flying at a distance of 20 miles apart.*"

This is the simple apparatus required for a 2-station installation. It weighs only 37 pounds packed for shipment.



Write us for detailed information and prices. We can make prompt delivery of interphone apparatus for your planes.

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Factory and General Offices
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OAKLAND, CALIFORNIA
San Francisco Offices 616 Mission Street

Large Order for Curtiss

The largest peace-time order for airplanes was placed recently by the Curtiss Aeroplane and Motor Corporation with its Buffalo plant.

The order calls for the building of 225 planes—both land and water—and 200 motors. One hundred and fifty of the planes will be the new Curtiss Orioles, the new three-passenger land machine and seventy-five Curtiss Sea Gulls, the MF boat equipped with a higher-powered motor and changed in hull construction to admit of two passengers and a pilot. The motors are the new Curtiss 150 horsepower motor. These motors, which will be the motor equipment for the Orioles and Sea Gulls, it is claimed, have a fuel consumption performance which has been demonstrated at one-tenth of a cent per mile.

Work upon the order will be begun at once at the Churchill plant of the Curtiss Aeroplane and Motor Corp. which has been placed upon a production basis. It is expected that a working schedule of one plane a day will be in operation in the near future.

"The order means that Buffalo, during the war the center of the aviation industry of the United States, will continue to remain one of the dominating airplane manufacturing centers," said J. A. Callahan, factory manager of the Churchill street plant at Buffalo. "It further means that the Curtiss Company, pioneer aerial experiment and construction, has faith in the future development of commercial aviation."

The Curtiss Corp. now has distributers organized in all sections of the United States and on August 9, C. W. Webster, supervisor of South American sales, will leave with a mission to tour the South American countries for the purpose of demonstrating American-made planes and, at the same time, to stimulate and promote aviation in general. He will take with him several of the best known pilots in the country and also the latest models including the Oriole, Sea Gull, Hornet, the fast two-place fighting plane, together with the OX-5 motors and the new Curtiss 150 and 400 horsepower motors.

Delivering by Mail

The first airplane agency in central Illinois, has been established at Galesburg by Lee Wright and Rollo Allensworth. They will handle the Curtiss and Canadian planes. The firm has been allowed the seven counties adjacent to their own for territory. It has been found that there is an urgent need for quick delivery of tractor, truck and implement parts during the busy seasons upon the farms, and the firm will cater to this trade. It is believed the extra cost will not be objectionable if the air service can save one or more days in harvesting.

In addition to the air taxi service, covering any section of central Illinois, carrying persons or packages, the firm will give exhibition flights in connection with county fairs, political meetings and other outdoor celebrations and amusements of various kinds. Hangars will be erected and a landing field provided adjacent.

Plans for Porte Ship

Although no official information is yet available regarding the proposed voyage of a flying boat from England to the Cape of Good Hope, to which Sir Charles Parsons referred at the recent engineering conference in Newcastle, it is said that the craft selected for the trip is a four-engine Porte superboat, named for the designer, which originally was intended for the trans-Atlantic flight.

It is understood the trip will be attempted early next month, by way of France and Spain, then along the entire length of the Mediterranean to Cairo, up the course of the Nile and over the great lakes of Africa to Blantyre, Nyasaland. The boat then will strike eastward to the African Coast and call at Beira, Delagoa Bay and at Port Elizabeth on the way to Cape Town. This route has been chosen in order to eliminate as far as possible the long overland stages for which a flying boat is not suitable.

Flying the Plane Home

In order to facilitate delivery of a Curtiss "Oriole" which he purchased, I. B. Humphreys of Denver, Col., is sending a pilot to New York with the intention of flying the plane to Colorado. A. M. Lendrum, who is an experienced Army pilot, is expected to leave New York with the ship.

Airplanes for Physicians

Learning of the successful use of the airplane by Dr. Frank Brewster of Beaver City, Neb., Dr. W. B. Helm of Rockford, Ill., was a visitor at the Curtiss plant at Garden City recently to look over a plane he expects to use in Illinois. He is one of the best known surgeons in the middle West. Dr. Brewster recently flew sixty miles to perform an operation, making the trip in fifty minutes. It would have required two and a half hours by automobile and more than four hours by train.

New Departure Detroit Manager

F. W. Marshner has been appointed manager of the Detroit branch of The New Departure Mfg. Co., succeeding the late Samuel B. Dusinberre.

Mr. Marshner has been with the company at its Detroit office for approximately seven years. He has a wide acquaintance with the automotive and machinery trades in the West and Middle West.

Mr. Crane Going Abroad

T. J. L. Crane, of the Wales Advertising Co., 110 West 40th Street, New York, sailed for England July 1.

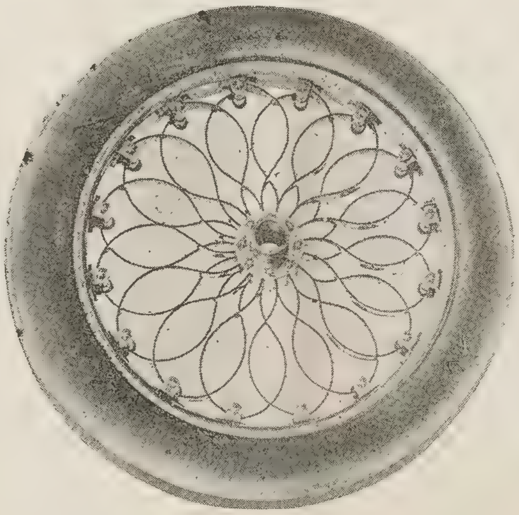
Airplane Steel Tubing

Julius Blum & Co., manufacturers of steel tubing, have removed from 510-512 West Twenty-fourth street, to 532-540 West Twenty-second street, New York City. This firm supplies large quantities of steel tubing to aircraft manufacturers, and found it necessary to enlarge its facilities.

ATLAS WHEELS

Are daily gaining in favor with manufacturers and pilots of aircraft because:

They Absorb Shocks *They Are Stronger* *They Are More Reliable*



Standard sizes carried in stock. Inquiries and orders will receive prompt attention.

THE ATLAS WHEEL COMPANY

ROCKEFELLER BUILDING CLEVELAND, OHIO

ROLLS-ROYCE

THE FUTURE OF FLYING
DEPENDS ON RELIABILITY

A telegram from Captain Alcock and Lieutenant Brown reads:

> "Congratulations on performance of the two Eagle Rolls-Royce engines which propelled the Vickers-Vimy safely across the Atlantic"

ROLLS-ROYCE AERO ENGINES LIKE ROLLS-ROYCE CARS
THE BEST IN THE WORLD

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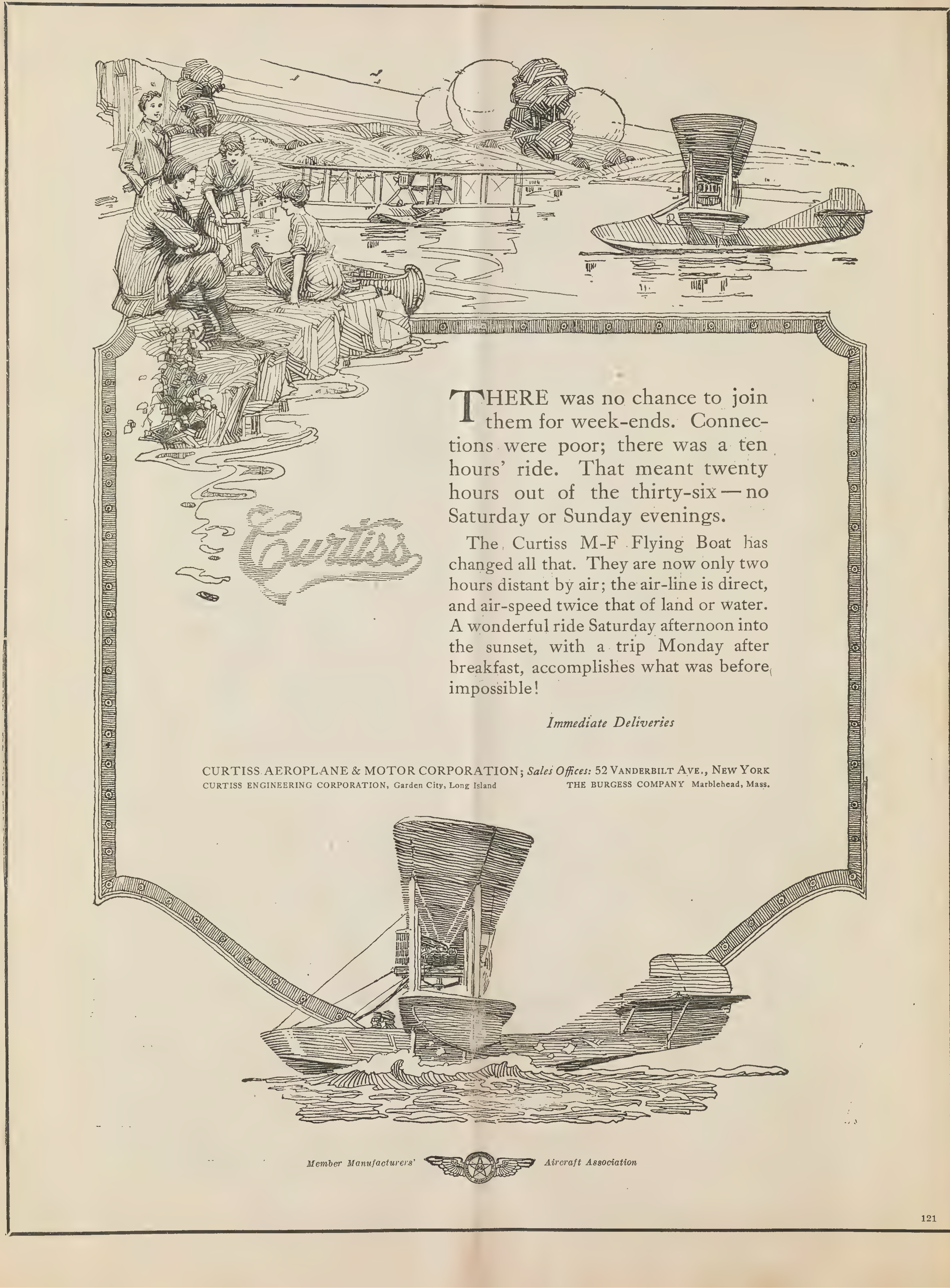

THERE was no chance to join them for week-ends. Connections were poor; there was a ten hours' ride. That meant twenty hours out of the thirty-six — no Saturday or Sunday evenings.

The Curtiss M-F Flying Boat has changed all that. They are now only two hours distant by air; the air-line is direct, and air-speed twice that of land or water. A wonderful ride Saturday afternoon into the sunset, with a trip Monday after breakfast, accomplishes what was before impossible!

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CURTISS AEROPLANE & MOTOR CORPORATION; *Sales Offices:* 52 VANDERBILT AVE., NEW YORK
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V #4

AIRCRAFT JOURNAL

July 26, 1919 *Every Saturday* *Price Ten Cents*

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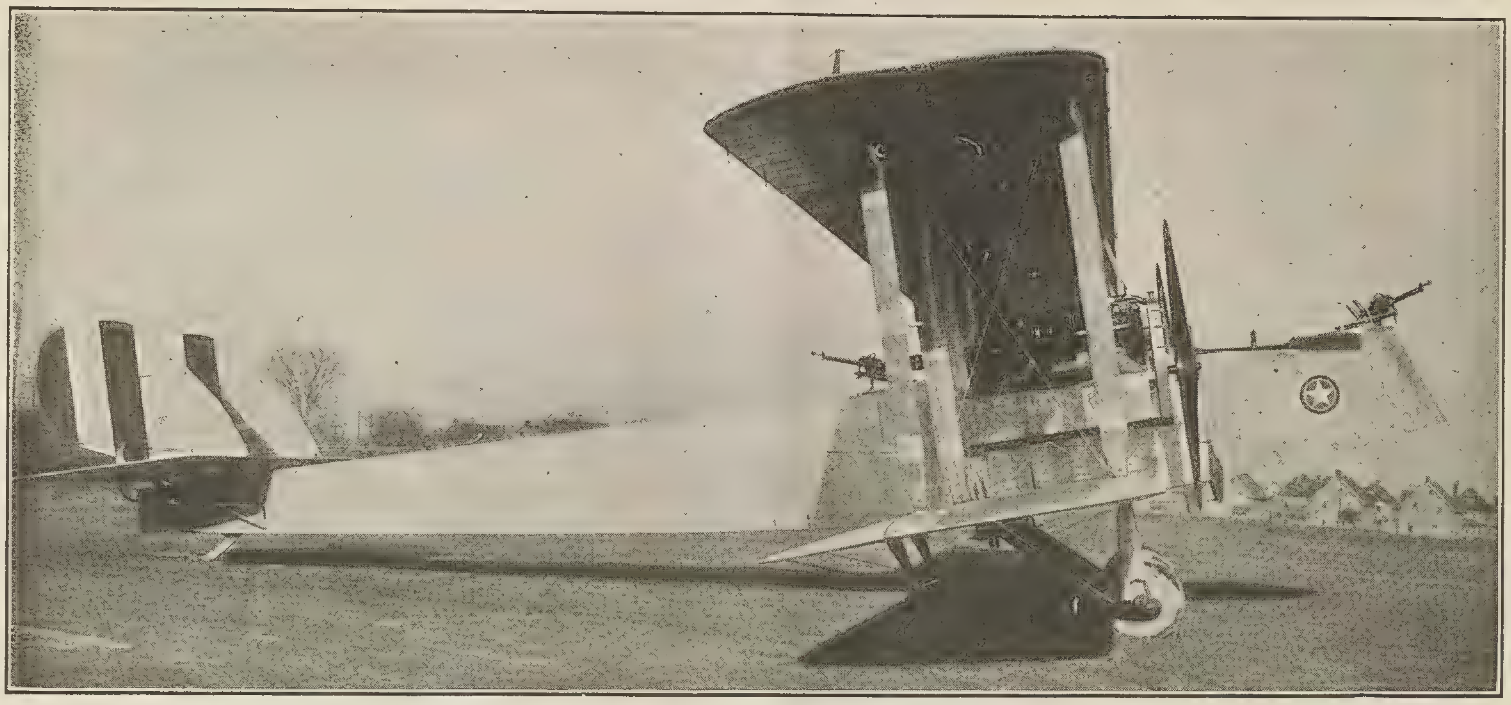

THE MARTIN NIGHT BOMBER

THE MOST IMPORTANT AERIAL DEVELOPMENT OF THE WAR

Officially, it has surpassed the performance of every competitor.

The forerunner of the wonderful

AERIAL FREIGHTER *and* TWELVE PASSENGER AIRPLANE

The skill and ability of the HOUSE OF MARTIN continue to maintain Supremacy of Performance and Dependability which they have held since 1909.

MARTIN U.S.A.

THE GLENN L. MARTIN COMPANY
CLEVELAND

Contractors to the United States Government

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Legislation Needed to Save Air Service

Joint Resolution Could Undo Mischief Caused by Cutting of Appropriations

JUL 2 [illegible]
Office Library

That official Washington is awakening to the gravity of the situation resulting from the lack of appropriations authorized by Congress for the development and maintenance of the Air Service is apparent from the occurrences of the past week. The appropriation of $25,000,000 for the Army Air Service for the coming fiscal year—a sum far below the totals allotted for similar purposes by Great Britain and France—will require a curtailment in matériel and personnel that will drop the United States far behind in aeronautics, a handicap that will take many years and prohibitive future appropriations to make up.

That the cut made in the Army Air Service's request for funds is not real economy is urged by proponents of the Air Service program, who have set a supporting movement under way by the demand for a joint resolution declaring that the commissioned Air Service personnel is supplemental to that of the Army proper. This will have the effect of increasing the average size of the entire Army only to the extent of authorizing a definite number of additional commissions in the Air Service.

War Department Admission

The necessity for some such legislation has resulted from the admission made by the War Department last week that the Air Service will be demoralized unless means are found to circumvent the order issued by Secretary of War Baker requiring all temporary officers to be discharged from the service by September 30, because of insufficient funds to permit their retention. This order will leave only the Regular Army officers, 232 in number, of whom 149 are pilots. Nearly all of these, it is said, have been doing administrative work since the United States entered the war.

The small force of Air Service officers will be enough only for three squadrons of airplanes, provided all can be assigned to duty. Not more than a single squadron can be manned if the administrative desks of the Air Service are to have any personnel at all. The work that will confront the small force of regular officers will be:

1. The manning of all training and service squadrons. The flying officers of the regular establishment would be sufficient for about three squadrons if all could be assigned to this duty.
2. The care of equipment. There are on hand in the U. S. more than 9,000 planes, 27,000 engines and 1,000 balloons of all types. The expert supervision of this equipment has been handled by temporary officers.
3. The study of Air Service tactics and the writing of manuals embodying war experience.
4. Experimenting with new designs of planes and engines, and studying foreign progress in these respects.

This reduction in personnel will force the abandonment of the following highly important Air Service projects:

Philippines—Calling for 4 observation squadrons and requiring 164 flyers and 16 non-flyers.

Hawaii—One squadron already stationed there, two more authorized, requiring 123 flyers and 12 non-flyers.

Panama—One squadron already stationed there, 2 more authorized, requiring 123 flyers and 12 non-flyers.

Border Patrol—Two squadrons operating, 4 more authorized, requiring 246 flyers and 24 non-flyers.

At war strength, each squadron to be effective should consist of 45 officers, including 41 flyers. A statement by the War Department with figures corrected up to July 12, accounts for only 149 regular army flyers and 73 non-flying officers.

Not Enough for Border

These flyers, all that will be left after September 30, are not sufficient for an effective aerial patrol force for the Mexican border, which calls for 246 flying men and 24 non-flying officers.

BENEDICT CROWELL
ASSISTANT SECRETARY OF WAR RETURNED FROM TOUR OF ALLIED COUNTRIES AS HEAD OF AMERICAN AERONAUTICAL COMMISSION

(c) *Underwood & Underwood*

The number of officers required for approved projects is 866 flyers and 190 non-flyers. To meet this demand there is a present Regular Army strength of 222 officers, consisting of 130 heavier than air pilots, 13 balloon pilots, 6 observers and 73 non-flyers.

The statement says:

"With the discharge of all temporary officers by September 30, the stations in Hawaii and Panama will have to be abandoned, as well as the proposed Philippines project, as there will be scarcely enough Regular Army officers, taking from the grade of General down, to maintain even two squadrons on the border.

"No provision can be made for taking care of the millions of dollars' worth of property at Government fields and storage plants; no system of United States coast defense; nothing left for training personnel; no administrative or executive force; no lighter than air development; scarcely enough officers for one balloon company, and no provision for carrying on any experimental work."

Forty-two balloon companies have been authorized, calling for a total of 210 observation officers and 126 ground officers. Each company requires eight officers, five of whom must be trained observers. The United States will have barely enough trained balloon experts for one of the forty-two authorized companies.

The War Department made public from the statistics branch of the General Staff figures giving the number of commissioned officers, regular and reserve, in the Air Service July 3. The total was 25,603, including 4,219 officers, eleven cadets and 21,373 enlisted men. The latest available figures, corrected to July 12, give a total of 4,851 officers, which included 417 awaiting immediate discharge and 369 on detached service, and 14,413 enlisted men, an aggregate of 19,264, or a reduction in nine days of more than 6,000.

Regular Army enlisted men now in the Air Service, including those who have enlisted during the last three months, now number 7,365, the remainder of the 14,413 listed on July 12 are due for discharge.

Secretary Baker, asked if the plans of the War Department for the Air Service are not seriously affected and upset by the necessity for discharging emergency personnel before the money appropriated for their pay is exhausted, declared the situation to be very serious.

Asked what steps could be taken under existing law to secure flying personnel, he said he could appoint only provisional Second Lieutenants. Men who consent to service at this rank would be eligible to appointment as regular officers after one year's service, provided they passed prescribed examinations. For this reason the prospect of securing the character of men desired for this new and increasingly important service is anything but bright.

Prospects for Resolution

Sentiment in Congress, especially in the Senate, is developing rapidly and there is a fairly good prospect that a joint resolution along the lines mentioned will soon be introduced and pushed. Few Senators have expressed opposition to reasonable provision for the Air Service pending the working out of a permanent policy.

The simplest way to handle the matter appears to be through the medium of a joint resolution specifically authorizing the retention of a definite number of commissioned officers in the Air Service. This number probably will be around 2,000, which would enable the service to continue its work, permit the organization of effective aero squadrons, save the vitally important technical engineering section, and furnish trained personnel to take care of the enormous quantities of equipment now at several flying fields and schools in storage throughout the country.

Such a bill will have a harder time in the House than in the Senate, but the rapidly growing sentiment in all sections of the country in favor of a real Air Service undoubtedly will influence members. In fact, many Representatives have expressed keen regret that the appropriations for the Air Service were cut down to $25,000,000 after the Senate, after careful inquiry, had determined that $55,000,000 was the lowest amount compatible with safety.

Their regret also extends to the provision for the pay of the Army, sharp cuts in which make it impossible to keep temporary officers in the Air Service after September 30, thus making it necessary to discharge virtually all active pilots now in the service. If a joint resolution or bill carrying no appropriation would save the Air Service, it probably would pass both Houses with much gusto. It will be necessary, however, at least to provide funds for the pay of the commissioned personnel specifically authorized for this branch.

San Francisco To Be Great Air Port

Major Loring Pickering Calls for Effort to Found Chief Pacific Transcontinental Air Terminal

Practical steps toward the establishment of an airport worthy of San Francisco have been taken at a meeting of the Commercial Club called by the Chamber of Commerce at the request of various interests. The keynote of the gathering was a determination that San Francisco no longer shall lag behind in the encouragement of the development of flying.

Among those present were Robert Newton Lynch and Vice-President Boardman of the Chamber of Commerce; Supervisors J. R. Mulvihill, Richard J. Welch and John C. Kortick; William Benedict, representing Mayor Rolph; S. L. Bibero, of the Pacific Aero Club; Postmaster Charles Fay, Reuben B. Hale, representing the Pan-Pacific Exposition; John N. Murray, representing California overseas flying men; Colonel H. H. Arnold, Department Air Service officer; Frank B. De Lyle, J. P. Young, Major Loring Pickering, Charles Lapworth, Edmond Coblenz and Eugene Cohn.

Consider Big Plans

There was an animated discussion of the bright prospects for the commercial development of flying if the city can be brought to realize its opportunities. Belief was expressed generally that if immediate steps be taken to provide the necessary accommodation for an airport adequate to the requirements of the new means of transportation, San Francisco may take its rightful place as the Pacific Coast terminal of transcontinental mail and passenger services, not to mention the trans-Pacific air traffic that is bound to come in the next few years.

Evidence was produced that San Francisco had stood still while other enterprising communities on the Coast have been for a long time active in aid of the commercial side of flying. Further, that while specific requests have been made by the Government for suitable landing places and supply stations for Army purposes, the extent of San Francisco's response so far has been to designate the Marina as a landing place, at best of doubtful value. On the other hand, municipalities up and down California, where, in fairness to San Francisco, it must be stated, large open spaces were easy to obtain, have already prepared landing-places which have been officially approved by the Army Air Service.

Give City's Program

Supervisors Mulvihill, Welch and Kortick presented an outline of the city's procedure so far in aiding both governmental and private enterprise. First consideration is to be given to government requests for aid, and in a statement presented by Major Loring Pickering an idea was given of the extent of governmental traffic of considerable dimensions in the very near future. This will include Army planes, Navy planes and dirigibles, and coast patrol airships. Major Pickering suggested a creation of a permanent city organization, representative of all interests, in liaison with the Army, Navy and post office authorities, to act officially for San Francisco in all aeronautical affairs.

Major Pickering's statement follows:

"It is suggested that a serious attempt be made by San Francisco to visualize and prepare for the future development of flying. By forethinking we ought to keep San Francisco in the forefront of enterprise in the air.

"Without setting them down in any arbitrary order of precedence it may be suggested that some of the aspects of flying that require consideration by the city are: (1) Army requirements. (2) Navy requirements. (3) Post Office requirements. (4) Commercial air services. (a) In California, (b) Transcontinental, (c) Trans-Pacific.

"(1) ARMY REQUIREMENTS.

"As yet there has been no comprehensive indication by the government of what it requires from States and municipalities in aid of national air service, although this may be soon forthcoming as a result of the strong movement for the establishment of an independent U. S. Air Service; but from the Army Air Service there has come specific requests that municipalities shall provide landing places and service stations.

"Already most of the cities of California have responded, and others are active; particularly in and around Los Angeles, where over twenty landing places have been officially approved by the army authorities. San Francisco so far has not provided one, due in large measure to the fact that the problem of finding open spaces in this city is not an easy one.

"Briefly the army requirements are: Provision by the city, at the cost of the city, of a landing place at least 600 yards in length leveled and cleared of obstructions, with no large buildings close in or power or telegraph poles and lines. Hangars to be installed by the Government; service and supply station provided by the city; personnel to be provided by the city.

"Landing place to be convenient, to be near car lines, and not more than half-hour from Post Office.

In reply to telegraphed request for information sent to El Paso, where he now is, General Mitchell wires that it is hoped the government will soon issue more specific request, and indicate its willingness to provide personnel for these landing places and supply stations. In all probability regular flying officers will be assigned, and equipped also.

"Congress has withheld permission for the purchase of landing places. Politics has been allowed to obtrude itself in this respect, to the detriment of flying, but undoubtedly the government will soon have to face anew this aspect of the problem. Until then we have to rely on State and municipal enterprise to tide over the situation.

"(2) NAVY REQUIREMENTS.

"With the coming of the Pacific fleet effort should be made by the city to ascertain what assistance may be rendered in the way of facilities for the flying auxiliary of the navy, which is bound to be considerable, and will likely consist of rigid and non-rigid dirigibles, flying boats and hydroplanes.

"In connection with the Aerial Coast Patrol, with both dirigibles and planes, the Coastguard Service, and the flying auxiliary to the Coast Artillery, supply stations will have to be provided somewhere in the bay. Inquiries in this respect have already been instituted by the authorities .

"(3) POST OFFICE REQUIREMENTS.

"Already the rapid extension of the aerial mail service has reached Omaha on its way West, which cuts delivery between San Francisco and Boston by twenty-four hours. It will be a reflection on San Francisco if the transcontinental mail arrives before we are prepared to receive it. And when it does first arrive the event should be celebrated as becomes its historic importance.

"Assistant Postmaster-General Praeger urges the great importance of having landing places within easy reach of city centers. Grant Park is used by the post office in the heart of Chicago.

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"Effort should be made to have San Francisco designated as the Pacific Terminal for the Transcontinental Aerial Mail.

"So far as can be learned in regard to mail service from San Francisco along the coast to Seattle and Alaska, and to southern and interior California cities, nothing has yet been planned, and the whole subject rests with Washington. Suggestions should be forthcoming from California communities: they would help the authorities in accelerating the aerial mail.

"(4) COMMERCIAL AIR SERVICES.

"There is need for education and stimulation of the public generally, as well as of business men, in regard to the possibilities of development of commercial flying.

"Nothing so far has been done by the city to have San Francisco made the Pacific Terminal of Transcontinental Air Routes. Already it is announced that the Apache Aerial Transportation Company will open New York-Los Angeles service in August. This company has regular service between Los Angeles and San Diego and Riverside. Los Angeles-Catalina seaplane service began last week. Machines for transcontinental service are twelve-passenger types.

"Several big companies, like the big tire corporations, are building dirigibles for transcontinental service. The discovery by American chemists of means whereby helium, a non-inflammable gas, can be produced at low cost, has given great impetus to the development of this branch of flying. What preparations can San Francisco make to welcome these airships and accommodate them when they arrive?

"When Capt. Roy Francis arrives in San Francisco, ending his flight from New York, what can be done by the city to celebrate the occasion and honor the flyer?

"Some time ago the Supervisors, acting on the suggestion of the Pacific Aero Club, officially designated the Marina as a landing place for aircraft.

"Trans-Pacific flying is as sure as trans-Atlantic flying. Where else should all the airships of the Pacific come but to San Francisco? Here again a need for immediate consideration and visualization. It cannot be long before regular aerial communication will be established between San Francisco and the Orient, Australia and South America.

"SUGGESTED LANDING PLACES.

"Of possible landing place in San Francisco the one that appears to meet most nearly all the requirements is the Marina. Already it is in almost daily use by flyers, but at great risk to the airmen because of broken surface of the ground and surrounding obstacles. None of the larger craft could make use of the Marina in its present condition.

"The Marina has the advantage of being able to give service to both airplanes and seaplanes. The latter, as well as flying boats, could take off or land in the roughest weather in the yacht harbor. The site is convenient to the car lines and near the business part of the city.

"The Stadium at the Golden Gate Park has been suggested as an emergency landing place, but is considered absolutely unsuitable and inadequate as a regular landing place.

"The old racetrack has also been suggested, but does not find much favor with the flying experts.

"AIRPORT FOR SAN FRANCISCO.

"While San Francisco is about it, ought we not to establish an *airport* that will be worthy of the city? If the possibilities in the commercial development of flying are such as are prophesized, ought we not to approach the subject in the way we approach, or ought to approach, the subject of the seaport of San Francisco? The State and city make substantial contributions in aid of commerce. We ought to be thinking in terms of State and city aid to aerial commerce. If not, the traffic will be upon us before we realize it, and then it may be too late; and the traffic will seek ports where it can get service.

The beginnings of the traffic can already be continental mail; Pacific Coast mail; transconti-

(*Continued on page* 18)

American Air Commission Returns from Tour

Will Recommend Creation of Separate Air Department Headed by Cabinet Official, It Is Unofficially Reported

The American Air Commission, headed by Assistant Secretary of War Crowell, which returned from Europe July 20 after a seven weeks' tour through England, France and Italy to study the air establishments of those countries, will, it is said, recommend that an Air Department headed by a member of the Cabinet be created, removing the Army and Navy Air Services from under the jurisdiction of the War and Navy Departments.

Lieut.-Col. James A. Blair, Jr.
Photo Harris & Ewing

It is understood that the plan to coördinate the nation's flying forces will be contained in the report of the mission to the War Department and transmitted to Congress by Secretary Baker.

Members of the Commission declined to be quoted, but stated that Mr. Baker in a few days will have before him a comprehensive plan creating sweeping changes in the American system of air services.

The belief that the members of the mission have agreed on the wisdom of the project is taken to augur well for its consummation. It is proposed that the new department assume control of the perfection and manufacture of all aircraft in the country, presumably licensing the manufacturers, the Army and Navy being given the right to requisition whatever machines may be required in time of war.

By coördinated control, which will be urged, quantity output could be speeded up to the maximum if the United States were at war, obviating the delays and blunders that characterized the production of aircraft during the early months of the war. Much of the extravagance that has been due to the division of authority would likewise be eliminated, it is pointed out.

One of the members of the Aviation Mission declared that practically all American experts were agreed that the United States is far behind her Allies in aviation matters and is falling further behind.

"It is discouraging to those of us who have been in close contact with Europe's great programme and brilliant air progress to learn that Congress is apathetic to our own aviation development," he said. "The thousands of resignations of aviators from our air service is a blow to our development in that line. There is no doubt whatever in the minds of those who have participated in this war, particularly those who have themselves been in America's air service, that the future, both in war and in peace, will find aviation a supreme factor in shaping the history of the nations. America, therefore, cannot afford to be a laggard if we are to retain our position among the great powers."

S. S. Bradley
Manufacturers' Aircraft Association
Photo by N. Lazarnick

With Secretary Crowell were Lieut.-Col. James A. Blair, of the General Staff of the army; Capt. Henry C. Mustin, U. S. N.; George H. Houston, of the Wright-Martin Aircraft Corporation; C. W. Keys, of the Curtiss Aeroplane and Motor Corp; S. S. Bradley, of the Manufacturers' Aircraft Association, and Howard E. Coffin, of the Council of National Defense.

Weather Reports Available

Civilian aviators contemplating long cross-country flights in any part of the United States may now wire Washington to find out what sort of weather they are likely to encounter, according to an announcement made by the Director of Air Service. This action is one of the first which implies recognition of the great part aviation is to play in commerce of the future.

"To assist aviators as far as possible to make their cross-country flights under favorable climatic conditions, subject to errors of a weather forecaster and without assuming any responsibility for accuracy, the meteorological officer of the information group, Air Service, U. S. A., will from the weather map reports and in consultation with the officials of the United States Weather Bureau attempt to forecast weather for flying in any part of the United States for thirty hours in advance of noon each day for the aviator making a request and stating points of intended flight," the announcement says.

"The result of this experiment may determine the value of an aerial meteorological service and warrant its organization as the cross-country flying increases and aircraft become more generally used for the transportation of passengers, mail and merchandise. Aviators making a flight following the prediction of the meteorological officer are requested to advise him as soon as possible as to the accuracy of the report."

Capt. Henry Coskey Mustin, U. S. N.
Photo Harris & Ewing

Investigation Foreshadowed

Investigation into the airplane situation was foreshadowed by a resolution introduced in the House last week by Representative La Guardia, of New York, who served with the Air Service in Italy during the war.

Under the resolution the War Department would be required to furnish the House a voluminous commercial inventory of present airplane equipment, the number and type of all aviation motors, their location, condition, extent of deterioration, use and price or cost, and the same information with regard to planes, spare parts and raw materials on hand. In addition, a statement would be given showing the quantities of such supplies now for sale.

Air Board at Work

The new Joint Army and Navy Aviation Board has held its first meeting with Secretary Baker.

Plans were discussed for the closer cooperation of the Army Air Service and the Naval Aviation Section, with a view to eliminating all duplication of work or expenditures, the discussion dealing largely with plans for the expenditure of the $25,000,000 appropriated for the Army Air Service and a like sum for the Navy.

Maj.-Gen. Charles T. Menoher, Director of the Air Service, headed the Army section of the board, and Capt. T. T. Craven, Director of Naval Aviation, the Navy end. Secretaries Baker and Daniels were also present.

Late Mail Service To Outgoing Ocean Liners Planned

Aeromarine Flying Boat Will Make Experimental Flight with Manifest and Papers for White Star Liner Adriatic

An experimental flying boat mail service to departing trans-Atlantic ocean liners will shortly be undertaken by the Post Office Department, according to information received by Thomas G. Patten, Postmaster at New York City, from Otto Praeger, Second Assistant Postmaster-General.

An official route has been established in cooperation with David Lindsay of the International Mercantile Marine, which operates the White Star Line. According to present tentative plans an Aeromarine flying boat will be loaded with a mail pouch and will fly out to the White Star liner Adriatic some hours after she has left her pier. Unless strike troubles interfere this experimental flight will take place on August 9 as the Adriatic leaves on one of her regular trips.

Postmaster Patten is making arrangements for the experiment through the courtesy of Inglis M. Uppercu, whose flying boat has been loaned to the Post Office Department for this experiment. The Aeromarine to be used has repeatedly gone out to meet incoming troop ships, and when the Twenty-seventh Division came home Pilot E. J. Zimmerman took the flying boat ten miles out to sea and dropped upon the deck of the Leviathan small pouches containing messages of welcome to the returning troops.

This demonstration convinced steamship officials of the practicability of speeding up trans-Atlantic voyages by releasing the ship immediately on loading and not waiting for the ship's papers to be fully prepared. The papers could be delivered by airplane while the ship was at sea and thus many hours and a considerable sum of money could be saved.

At the request of David Lindsay of the White Star Line, the Post Office Department became interested and an official experiment was decided upon. It has not yet been decided whether the pouch will be dropped directly upon the decks of the Adriatic or whether it will be attached to a parachute and dropped into the sea to be picked up by the ship as it passes.

Mr. Patten in making arrangements for the experiment has found that shipping companies regard the plan with considerable interest. Ships usually load until the last minute, and then a manifest has to be prepared and filed with the Custom House as to what the vessel contains. The ship also has to have a copy of the manifest in order to get into the port to which it is bound. The officials at that port must know what the vessel contains in order that proper tariffs and customs duties may be levied.

Naturally, preparing a manifest is a bookkeeping job. No data can be entered until the vessel is loaded, all of which would mean delay ordinarily. Slow-going freighters get around the difficulty by sailing out of the harbor under bond of some kind that the owners will file the manifest with the Custom House within a given number of hours after the vessel has left. A copy of this manifest is sent by a swifter passenger vessel to the other side, where it is on hand and available when the freighter arrives.

Mr. Praeger expects to be present when the flying mail boat takes off with the Adriatic's papers and other special airplane trans-Atlantic mail.

Glenn L. Martin Carrying Mail in 1911
Plane is Early Pusher Type With Interplane Ailerons and Front and Rear Control. Note Also Warner Anemometer for Recording Speed of Flight in Early Days

Pacific Coast Taxis

The Pacific Aviation Company, of San Francisco, Cal., has established an aerial taxi service on the Pacific Coast. Two passenger planes, piloted by B. M. Spencer, former test pilot at McCook Field and Sam Purcell, former instructor at San Diego, are operated at present between any California Cities, while it is planned to install a fleet of ten passenger carrying planes within the next few months. The two planes now in use are of the Glenn Martin TT type with Curtiss OX-5, 90 hp. motors.

In addition to having carried more than 500 passengers to date, the Company recently delivered a vial of serum on the rush order of a physician from San Francisco to Stockton in fifty minutes. Copies of the *San Francisco Bulletin* were also delivered by plane.

Raymond A. Duhem is general manager of the Company which has headquarters at 985 Market Street.

Martinsyde Attempt Off

The Martinsyde biplane Chimera crashed again in making her second attempt to start the cross-ocean flight at the Quidi Vidi aerodrome and was wrecked beyond repair. Frederick P. Raynham, the pilot, and Lieutenant Conrad Herbert Biddlecombe, the navigator, were not injured.

Raynham has received orders to abandon further attempts and return to England. He and his navigator directed the crating of their plane, and both left with it on the steamer Grampian. Their mechanics returned to England with them.

Planes at Police Games

Colonel Archie Miller, in command of the Long Island aviation fields, commanded twenty airplanes through a dense fog and rain from Hempstead to Sheepshead Bay Speedway at the New York Police Games last Saturday. Colonel Miller's squadron consisted of De Haviland and Curtiss machines of the JN-4 and JN-4H types, followed by a Handley Page, driven by Lieut. Philip Melville, who had with him seven passengers.

At times the fog was so dense that flying above 500 feet was dangerous. Some fliers were compelled to land en route owing to the danger of collision, but all took the air again and reached Sheepshead Bay, where the police games were being held. Every aviator held to his position and landed without difficulty when the signal was given.

Captain A. E. Samonin drove a captured Fokker, Lieut. John O'Donaldson and Lieut. H. D. Norris, American aces, piloted Sopwith machines. Other officers were Lieut. R. C. Kirkpatrick, Lieut. F. P. Roullot, Major Henry J. Miller, Capt. M. G. Cleary, Major J. H. Lyon, Lieut. J. H. Barksdale, Lieut. U. S. Jones, and Capt. Harry Smith. Four enlisted men, master signal electricians, also drove their own airplanes. They were Signalmen Zimmerman, McGraw, Burnett and Moss.

Victory Medals for All

Soldiers and sailors of the allied nations who have seen at least three months fighting service are eligible for the "Victory Medal" which the French Government proposes to institute.

The medal will be of bronze, about an inch and a half in diameter,

The obverse will show a winged figure of Victory without any inscription, while the reverse will bear the words: "The Great War for Civilization," with the name and in the language of the allied state to which the bearer belongs.

The ribbon will be the same for all allied nationalities. It will have a double rainbow on a red ground, with white edges.

Wright-Martin Merger

An absorption of part of the assets of the Wright-Martin Aircraft Corp. by the International Motor Truck Corp., and the retention by the common stockholders of Wright-Martin of their present aircraft business has been approved by the directors of both companies. This was practically agreed upon more than a month ago.

The Wright patents and the Hispano-Suiza license agreement, will be transferred to the aeronautical corporation, together with new business for airplane motors, declared President Houston of the Wright-Martin Corp.

Air Delivery Now Available For All First-Class Mail

Postmaster-General Fixes Postage for Air Mail at Regular Carrying Rate of Two Cents an Ounce

The air mail service has been placed upon an equal footing with all other means of mail transportation as the result of an order issued by Postmaster-General A. S. Burleson, July 18, fixing the postage on the mail carried by airplanes at two cents an ounce, the regular postage rate for first-class matter.

The experiments during the year, it was announced, which have been devoted to the adaptation of the airplane to the needs of the regular daily mail service, have demonstrated possibilities for increased efficiency for mail transportation beyond the expectations of the Department.

Since the conclusion of the war, by the use of the Liberty engine and the availability of large planes salvaged from war stock, mail in greater quantities can be carried, as well as greater speed made.

Thus, approximately more than 10,000 letters a day for Seattle, San Francisco and Los Angeles and other points on the Pacific Coast, which fail to connect with the westbound 8:40 p. m. train out of New York, are now being advanced 24 hours daily to their points of destination. In the same way mail from New York that did not catch the 5:15 p. m. train for the West, is now being delivered in Chicago in the afternoon instead of the following morning.

Arrangements are now being made to place in the New York-Washington route the three fastest airplanes in the air mail service, each having a capacity of 18,000 letters and a maximum speed in calm weather of 132 miles an hour.

" The successful operation of the air mail for more than one year and the great development for commercial work on the airplane in that period has taken this phase of mail transportation entirely out of the class of experimental work," said Postmaster-General Burleson in announcing the new policy. " The great saving of time now effected over the fastest railroad train between New York and Chicago will enable the Department to make a saving in car space of more than twice the cost of the operation of an air mail service on that route. It will therefore no longer be necessary to charge more than the regular rate of postage for the transmission of airplane mail.

" The success of the airship in carrying the mail, together with the great development that has taken place in speed, in quantity of mail that can be carried and certainty of operation, makes it improbable that the air transportation of mail, whether by the Government or commercial air transportation lines, will ever be stopped, but will increase from year to year by leaps and bounds, especially over long distances.

" The great expedition of mail by this means of transportation constitutes a service which the public throughout the country is now demanding and in course of time will receive, as supplementing the train service. For these reasons the air mail has been placed on the same basis with all other means of transportation and the rate of postage made the same as over all other means of mail transit."

The effect of the order, Second Assistant Postmaster-General Otto Praeger explained, is to place all first-class mail on the same basis, and the question of time in mailing will determine whether or not a letter will go by airplane instead of by train. Letters in transit which miss train connections will be forwarded by airplane to make up the lost time.

It was stated that there was no guarantee under the new arrangement that a letter would go by airplane, but that persons might go to postoffice stations where airplane mail sacks were made up and request that their letters be put in these sacks.

Lieut. J. C. Edgerton, in Charge Aerial Mail Service Pilots

(C) Harris & Ewing

Special airplane stamps will be abandoned and letters need not be marked " via air post."

Flies Over Mediterranean

Captain Morchal, an aviator who tried to fly from France to Russia during the war but was obliged to land within the Austrian lines, flew July 20 in a hydroairplane from St. Raphael, Department of Var, across the Meditterranean to Bizerta, Tunis.

Captain Morchal covered the distance of about 450 miles in 5 hours and 40 minutes.

Italian Sets New Record

New records for European airplane flights were established July 16 when an airplane, piloted by Lieut. F. Brackpapa, and carrying Lieut. Bonacieni, arrived at Croydon, England, from Rome

The flight from Rome to Paris was made in seven hours and from Paris to England in an hour and a half.

Diffin Sails for England

In order to study the new types of foreign airplanes and confer with London bankers and airplane manufacturers with a view of establishing close international commercial aviation connections, F. G. Diffin, president of the United Aircraft Engineering Corp., of New York, the concern that recently purchased the entire flying equipment of the Royal Air Force in Canada which was originally valued at close to ten million dollars, has sailed for Liverpool.

Mr. Diffin was active in Washington in the standardization branch of aviation research during the war. In February and March of 1918 he was sent abroad with a commission, of which he was chairman, for an International Standardization conference in London.

The work of this committee has been officially recognized by the Allied governments, particularly for the way in which it solved the airplane fabric situation which was so acute at that time. In recognition of Mr. Diffin's work at that time he was elected a Fellow of the Aeronautical Society of Great Britain.

Incidentally Mr. Diffin will establish a London branch of his organization.

British Airship

The British Government has begun the construction of the largest dirigible that has yet been undertaken in any part of the world, one that will carry an equipment of six airplanes for its own protection against heavier-than-air craft, according to recent reports.

This dirigible and the two hangars to be built for it will cost $9,000,000, according to the information reaching military men in America. It will have a capacity of 10,000,000 cubic feet, will be 1,100 feet long, 137 feet in diameter, and capable of lifting 100 tons, which would be about five times the lifting capacity of the R-34, which has just made a round-trip voyage across the Atlantic. The cruising radius of the new dirigible, which will be finished in from eighteen to twenty months, is given as 16,000 miles, and it could, it is said, easily undertake the voyage from England to Australia without a stop.

Prize for Trade Trips

The *Daily Express* offers a prize of $50,000 open to the world, with the exception of the late enemy countries, for an air flight establishing communication on a commercial basis with India and South Africa.

All competing machines must carry a useful cargo of at least one ton on outward and homeward flights. Factors in the award will be average reliability and airworthiness of machines.

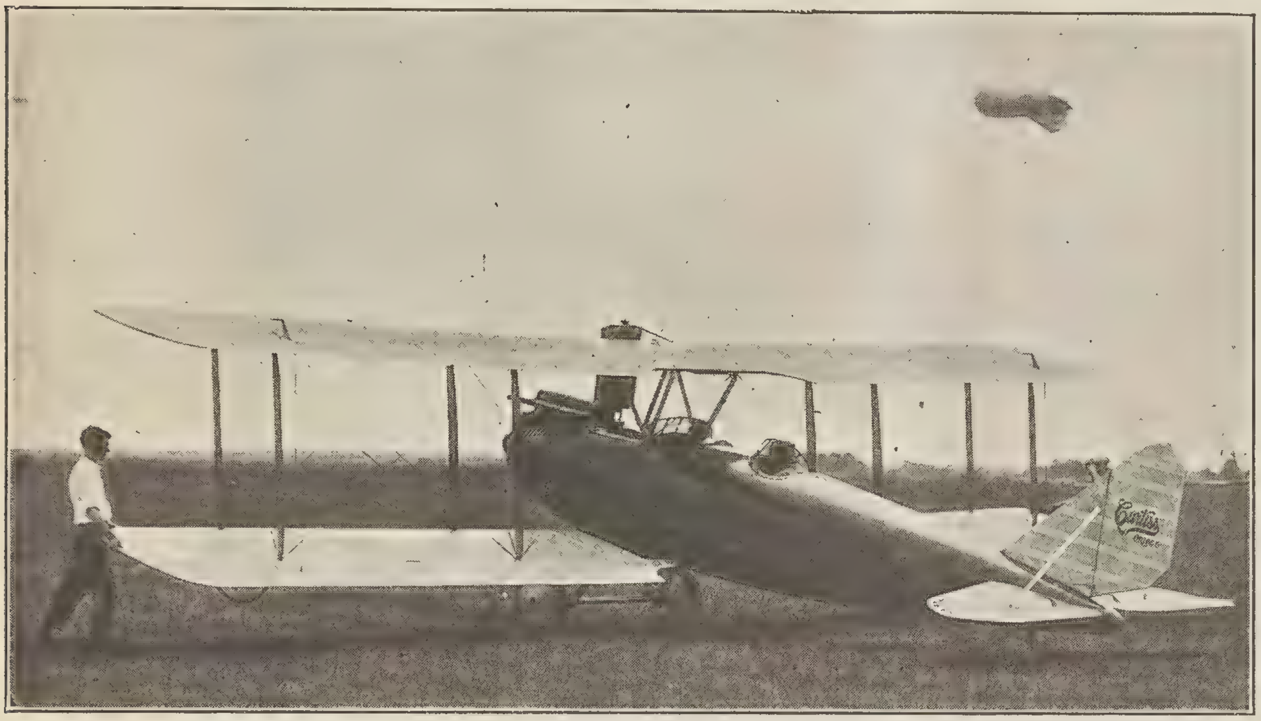
This is the first of the large money offers to require that the contestants carry a useful load tending toward the establishment of commercial relations by air. The conditions of the award are also interesting.

Crossing the Sierra Nevadas by Airplane

Army Lieutenants Tell of Difficulties Encountered in Flying Over Peaks of Western Mountain Ranges

Lieut. Jay M. Fetter, R. M. A., A. S. A., in a report of his flight and that of Lieut. Tobin S. Curtis, Mather Field, Sacramento, Cal., to Ogden, Utah, crossing the Sierra Nevadas in his flight, says:

"I left the ground at 10.30 a. m. We were both flying Curtiss H's, equipped with Hispano-Suiza 150 hp. motors and two auxiliary gasoline tanks, one on either wing. We were carrying 56 gal., or a weight of 392 lb., in gasoline. The two tanks weighed about 15 lb. apiece, making a total of 422 lb. for fuel. Lieut. Curtis carried the baggage, about 100 lb., and I carried the Mechanic-Sgt. La Jotte.



THREE PASSENGER CURTISS ORIOLE, IN WHICH ROLAND ROHLFS MADE FAST FLIGHT

"Immediately on taking off we started getting our altitude, as we should need at least 8000 ft. to get over. I soon found that I would be unable to get enough by the time I reached the foothills about thirty miles distant, so I started to climb in wide circles, and noticed Lieut. Curtis doing the same. We had been in the air about 30 min. when we had 6000 ft.; it took us 17 min. to get the next 1000 ft., and above 7000 ft. our climb was slower than before, and I tried at least 10 min. to get over 7200 ft., but made no headway. I was still trying to climb when Lieut. Curtis signaled to go back to the field. We landed at 11.40 a. m.—and the engineering force immediately sent out men to take off the auxiliary tanks.

"We started again at 1.30 and climbed steadily toward the peaks. I experienced the same trouble as before at 7000 ft., and came to the conclusion that down-moving air at that altitude was the biggest cause of our trouble. However, I finally managed to get 10,500 ft.; but by the time I had reached Lake Tahoe I had lost sight of Curtis, but knew from where I had last seen him that he was somewhere above and beyond me. I struck the lake at about 10,000 ft. and circled the south end, found an open cañon and started down. In cruising around the lake it was very rough. Sgt. La Jotte tried to get some pictures, but the ship was being thrown about so violently that I motioned him not to try, as he, being in the front cockpit, had to unhook his life belt and turn around in order to snap his camera.

"Within 10 min. after leaving the lake we were in the valley on the other side, with fairly good landing fields close by.

"We soon caught sight of Curtis landing just south of Carson City in a road, and went down to land back of him, having been in the air 100 min.

"There is a good landing field at Reno, but it had been flooded during the night and was soggy that morning. With 2500 ft. altitude above ground, out of Carson City there is no time when a landing field could not be found between there and Reno.

"Left Reno at 10 a. m. Maximum altitude 3000 ft. above ground. For the first thirty miles there is little chance for landing, as it is all mountain, with the railroad winding through a narrow cañon. About ten miles west of Hazen the desert begins, and from there landing fields are everywhere. Many large, dry lakes are on the road, and they make excellent fields. Arrived at Lovelocks at 11.10, making the 90 miles in 70 min. The air of the desert was very rough and bumpy, particularly over the dry lakes, where there was no vegetation.

"Left Lovelock at 12.30 on a straight course to Battle Mountain, about 90 miles northeast. As soon as I had gone over the second range I decided I was off my course, but I knew a general easterly course would bring me to the Nevada Central railroad or the main line of the Southern Pacific. After $1\frac{1}{2}$ hr. flying I found the Nevada Central railroad, and knew in a general way where I was; it must have been about 20 miles south of Battle Mountain; altitude 3000 ft. I felt sure I could not make Battle Mountain, and decided to keep close to the railroad. I saw Dillon, a small village located 17 miles south of Battle Mountain, and went down to land, as there was a small, cleared space running north and south. A strong west wind and telegraph wires kept me from landing there, so I had to land in the brush, which I did with no damage to the ship except a few small rips in the ailerons; 2.35 p. m. Left Dillon at 6.05 p. m.

"There were few landing fields found on this leg of the journey; about three dry lakes, but a very good small field at Battle Mountain.

"Left Battle Mountain at 7.20 in a strong west wind. Arrived at Elko at 8.10. Did 40 min. stunting there; had a hard time getting altitude. All stunts were under 2000 ft. Left Elko at 12.10; ran into hailstorms 10 miles distant. At 1.25 p. m. I landed at Montello; 85 min.

"Swampy Valley, between Elko and Montello, affords few landing fields. A small, dry lake close to the railroad at Montello makes a very good field.

"Left Montello at 2.10 for Ogden. For the first 20 miles out of Montello there are landing fields. At Umbria Junction the Great Salt Lake Desert begins, and, although I did not land at any time, I was told that at this time of the year the whole desert is very soft underneath from seepage from the Great Salt Lake. I flew most of this course at about 2000 ft., including the Great Salt Lake. About in the center of the lake is a peninsula which no doubt could be landed on, and from the east edge of the lake to the landing field at Hot Springs north of Ogden there are a few fields."

Rohlf's Cross-State Flight

The flight made by Roland Rohlfs, test pilot of the Curtis Engineering Corp., from Buffalo to New York, 450 miles, in five hours and two minutes without a stop is believed to be the longest non-stop flight made by a small plane without special equipment. One of the new Curtiss three-passenger Orioles was used by Rohlfs, who was delivering a number of souvenir books for Glenn H. Curtiss' banquet to the NC fliers, and it gave an excellent account.

Rohlfs left Buffalo at 1:30 in the afternoon and landed at Hazelhurst Field, Long Island, at 6:32. He averaged 90 miles an hour, his speed between Buffalo and Albany being at times 100 miles per hour. After leaving Albany he ran into a cross wind which cut down his flying speed to 60 miles an hour. The Empire State Express, traveling over the same route, makes the run in ten hours.

"The machine which was equipped with one of the new Curtiss 150-horsepower motors, was given a twenty-five minute test before the start," said Rohlfs, who will attempt to set a new altitude record this week. "After Albany I had to cross over the river several times to be sure of landing fields and in some places I had to fly lower than the mountains. It was 'bumpy' all the way, but my motor worked splendidly and without a miss."

The Oriole, the first three-passenger plane to enter the commercial world, was announced by the Curtiss Company in May and since that time orders have been received for more than 150 of this model. The Churchill plant, Buffalo, is now on a production basis on Orioles and they are being manufactured at the rate of one per day. It was designed in response to the demand for a three-passenger plane for sportsmen and passenger-carrying. Its overall dimensions are: length, 25 feet; width, 36 feet, and a chord of 5 feet. Its total weight is 2,188 pounds, carrying a useful load of 767 pounds. Its service ceiling is about 15,000 feet and its maximum ceiling about 17,000 feet. Equipped with a K-6 motor it has a high speed of 96 miles per hour and a low speed of 47.1 miles per hour.

In Darkest Africa

A flying boat or an airplane may soon form a part of the equipment of modern missions in blackest Africa, according to a letter received by the Curtiss Airplane and Motor Corp. from the Congo Mission of the Disciples of Christ, the headquarters of which is at Coquilhatville, Belgian Congo.

"We are interested in the matter of the purchase of flying boats to replace wholly or in part the fleet of launches which we have been planning for service in communication between our various stations," the letter stated. "We have a large river steamer for transportation between stations which seaplanes might supply. Our area is about 500 miles east and west and 200 miles north and south in extent. The whole area is covered well by an extensive system of waterways. In inland points landings might be made in small machines in the straight, smooth, central streets of the native towns, which in this section are usually clear of grass and other obstructions and are not less than 100 feet wide."

News of the Army and Navy Air Services

Long Martin Bomber Flight

Lieutenant-Col. R. S. Hartz, commanding officer of Bolling Field, is in charge of an endurance flight in a Martin Bomber that will traverse 31 states of the Union. Colonel Hartz will take a rim-around-the-country route that will require him to twice cross the continent. Lieuts. Ernest E. Harmon and Lotha A. Smith, pilots, and Sergt, John Harding, Jr., mechanic, accompany him. The schedule as announced by the Air Service follows:

Washington to Miami, 1,120 miles; Miami to San Antonio, Tex., 1,140 miles; San Antonio to San Diego, Cal., 1,120 miles; San Diego to Seattle, Wash., 1,170 miles; Seattle to Duluth. Minn., 1,375 miles; Duluth to Augusta, Me., 1,345 miles; Augusta to Washington, 535 miles; total, 7,805 miles.

It is not planned to make this long flight direct between cities but to vary it according to considerations and demands to be detetrmined by Colonel Hartz. The flight is designed to test the endurance of the Martin Bomber and give the Liberty motor another severe trial.

Flights will be made by Colonel Hartz and his associates over 31 States. They will pass over or near 95 cities, 29 National forest reservations, 36 mountain ranges and mountains, portions of 48 oceans, gulfs, bays, seas and lakes, 27 railroads, 88 rivers and 13 transcontinental routes. Colonel Hartz will fly over approximately 344 miles of New York and 103 miles of New Jersey. His mileage in California will be 900 and in Florida 938.

This is the most extended flight yet planned by the Air Service in the interest of recruiting, the charting of routes and the location of landing fields.

Permanent Ranking

Permanent ranks of General in the Regular Army for Gen. Pershing and Gen. March, Chief of Staff, and permanent ranks of Admiral in the Navy for Rear-Admiral Sims and Admiral Benson, Chief of Operations, have been asked of Congress by President Wilson.

Air Service Demobilization

The Air Service was 87 per cent. demobilized July 3, according to an announcement issued by the Statistics Branch of the General Staff.

This showed 25,603 officers and men as follows:

Officers	4,219
Cadets	11
Enlisted men	21,373
Total	25,603

The total is 13 per cent. as large as the strength on November 11, 1918. Of the officers 234, or 6 per cent., are the regular establishment. The other 3,985, or 94 per cent., are temporary officers subject to discharge before September 30.

Enlisted Men Flying

Enlisted men of Classes "A" and "B" are now being allowed to take flying training. Class "A," in which there are 64 men, are entitled to take examinations for the grade of Reserve Military Aviator. Class "B," in which there are 74 men, may take flying training, but will not be allowed the Reserve Military Aviator rating on completing the course. Physical and mental qualifications determine the class in which the applicant is placed. Applicant must be enlisted in Regular Army.

Seeking Camera Men

The Army Air Service is looking for competent amateur and professional photographers with whom to build up a crack aerial photographic section.

Late in July a photographic recruiting expedition is to leave Langley Field, Va., to visit forty-six cities and towns in Delaware, Maryland, New Jersey, Pennsylvania, Virginia and West Virginia. The expedition will travel in five Curtiss II airplanes and a motor truck and lorry. The truck and lorry will be a complete photographic developing and printing establishment, containing also a place where recruits may obtain their first insight into the work performed upon the film and plate after they are taken from the camera.

Members of the 94th Aero Squadron at Coblenz

(c) *International Film Service*

An advance airplane and scout will select landing fields and map out the course to be followed. The planes of this squadron are equipped with the latest type of aerial cameras, and photographs will be made from the planes of places passed over, from other planes of the expedition in flight and from the ground, using the gunnery, oblique and other cameras.

Recruits will receive a thorough course at the United States Army School of Aerial Photography, Langley Field.

The army dirigible A-4 is now at Langley Field, and also a Handley-Page bomber capable of taking off with twenty-five men and a complete aerial photographic outfit on board.

Enlisted men operating in the airplanes, balloons or dirigibles as photographers, after reaching a certain stage of efficiency, may receive the double wings and be put on a flying basis, which will add 50 per cent to their base pay.

To Test Coast Defences

Plans have been prepared by the War Department for extensive tests of new coast defence material in conjunction with the Air Service. A special squadron of airplanes, including twenty De Havilands, will be used, and now are being assembled at Langley Field, Va. New railway mounts for heavy ordnance are to be tried out at the Cape Henry fortifications, the manoeuvres inluding the rapid transfer of these pieces to various points along the coast in the vicinity and their use in repelling threatened attacks, with airplanes spotting the distant target and reporting results.

Radio to Aid Fliers

The Army transcontinental flight from New York to San Francisco will be reported regularly at half-hour intervals by means of a chain of radio stations which has been established across the continent by the American Flying Club, according to a statement by William R. Russell of the American Flying Club Radio Service.

"This chain of stations," said Mr. Russell recently, "covers districts in all parts of the United States, and will make it possible for any aviator flying cross country to be always in touch with any city or town in the United States. In case of an accident or forced landing in an inaccessible place, the district radio operator can send assistance to the machine in trouble. By means of this chain of stations it will be possible to get immediate reports and maintain constant communication with all aeronautical activities in the country. This is the first time in the history of aviation that a definite system of communication has been established.

"Our organization has at the present time over 1,000 stations in operation and will soon have stations within a range of 100 miles of each other. If assistance, such as gas or other supplies, is needed, help can be immediately rushed by automobiles to the designated points. The radio operator can also give the best available landing place in his district in case it is necessary to make a forced landing."

Aerial Carnival a Success

An aerial carnival held at the U. S. Army Balloon School at Fort Omaha last week, scored a tremendous success, more than 25,000 spectators witnessing the proceedngs. The entire program was carried out despite high winds.

74th Aero Squadron

The War Department announces that the 74th Aero Squadron has been organized at Langley Field, Va., to utilize 20 De Haviland airplanes in connection with coast defense. This squadron, commanded by Capt. Cleaton Reynolds, who commanded the 104th Squadron in St. Mihiel and the Argonne offensive, will carry on aerial adjustment of artillery fire for the coast artillery batteries at Fort Monroe and will adjust floating targets as far as 20 miles out.

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Formerly Air Service Journal

The Air Department

THE return from Europe of the joint military and civil aeronautical mission headed by Assistant Secretary of War Benedict Crowell seems to portend considerable changes in the organization of our aeronautical establishment.

For some time past the conviction has been growing among those concerned with the best interests of American aeronautics that prompt and energetic steps would have to be taken lest this country fall hopelessly behind Great Britain, France and Italy in aircraft development. While our major associates in the war have since the signing of the armistice spent a considerable amount of money and ingenuity with a view to converting their huge war-time air establishments into agencies of aerial transport, this country has practically been at a standstill in aeronautics since last November, apparently preferring to action an attitude of watchful waiting.

The unwarranted parsimony displayed by Congress with regard to the Army and Navy air appropriations, coming on top of six months of virtual suspense of aerial activities, and the feverish activity shown by Great Britain, France and Italy in establishing commercial air services all over the world seems to have at last roused the Government to some action. The aeronautical mission, which spent seven weeks abroad in investigating the organization and status of European air establishments will, it is rumored, shortly make a report on its findings and recommend that Congress pass a law providing for the creation of an Air Department, headed by a cabinet officer, which is to have supreme jurisdiction over all aerial matters, be they military, naval, or civil.

This scheme would probably necessitate the fusion of the Army and Navy Air Services into a unified service similar to the Royal Air Force of Great Britain, thus removing them from the control of the War and Navy Departments, while it would at the same time provide a clearly defined Government agency for the control of civil aeronautics.

That a practical organization of aerial transport services cannot be effected without the coordinating assistance of the Government is obvious enough in view of the many problems involved in the inspecting, registering and licensing of aircraft, the issuance of rules for aerial navigation, standards to be observed in creating public aerodromes, lighting schemes for night flying, etc. At the present time these questions may on the strength of a technicality come under the jurisdiction of half a dozen Government agencies; the resultant dispersion of authority could but adversely affect civil aeronautics and indefinitely retard its legitimate growth. Therefore, from the viewpoint of aerial transport and civil flying, the creation of an Air Department would be full of promise for a bright future. And beside the above considerations there is the fact that, as a self-contained Government agency, the Air Department would have its own appropriation, part of which might be set aside for the development of commercial aircraft, aerodromes and general aeronautical research work. These are all works of public utility and most emphatically deserve Government assistance.

From the standpoint of military and naval aeronautics the creation of a single Air Service may not prove an unmixed blessing. Sentiment in this respect is rather sharply divided in the Army and the Navy, the former being on the whole more favorable to the fusion than the latter. While a single service may raise the efficiency of aircraft production by doing away with duplication of expenditures, it would also kill a healthy competition—and nowhere is this more needed for keeping abreast with times than in aeronautics.

It is also claimed that an independent Air Department and a single Air Service would also greatly aid in creating a staff of officers who would conceive and work out the problems of aerial warfare "from the air down," so to speak, rather than "from the ground, or the ship, up," that is, they would consider the Air Force as the coming first line of defense and elaborate a strategy and tactics untrammelled by military or naval conventions. This is rather a delicate subject, one so open to unlimited and inconclusive discussion that only practical experience can be relied upon for a decision one way or the other.

The story of the Independent Force, R. A. F., which conducted independent aerial warfare on the stragetic centers of Germany with such conspicuous success is the only indication we have as to the soundness of a self-contained aerial striking force, which might be likened to the first line of defense. This notwithstanding, for the immediate future the Army and Navy will both need, and badly need aircraft for reconnaissance, artillery observation, liaison work, and the like. Now, for this kind of work the military aviator must be trained as an Army officer, while the Navy pilot must be trained as a naval officer, because the scope of their duties is fundamentally dissimilar.

Thus, the proposed unification of the Air Services brings up some very portentous problems, the solution of which will require the most careful and dispassionate consideration.

Maintaining the Personnel

IT is devoutly to be hoped that Congress will take early steps to remedy the damage promised by the curtailment of Army Air Service appropriations to $25,000,000. This figure is not sufficient to maintain even a small Air Service; it requires as well the abandonment of a carefully-planned approved Air Service program in the Philippines, Hawaii and Panama; it means a weak border patrol. Furthermore this near-sighted policy is inaugurated at a time when foreign nations, released from the stringencies of war, are paying every attention to a vast development in the aeronautical field, military as well as commercial. Should the United States lose sight of aeronautical leadership at this early stage, but little can be expected of the future.

Under existing legislation the Secretary of War is empowered to appoint only provisional second lieutenants, who are eligible to Regular Army appointments only following the passing of prescribed examinations after a year's service. This, especially in view of the fancy offers made to fliers by private enterprise, makes the securing of the best type of young men as Air Service pilots increasingly difficult.

Immediate legislation is necessary to counteract the unfortunate order requiring all temporary officers to be discharged from the service by September 30. If a joint resolution will accomplish the much desired result, let Congress take such a step with the least possible delay.

Notes on Technical Aeronautics

Design and Construction of Flying Boats

The following is an abstract of an article by Captain David Nicholson which appeared in a recent foreign publication. During the war information regarding the design and construction of aircraft was rigidly guarded, consequently little has been published on the design and construction of flying boats, and what follows may to a certain extent, remedy the deficiency at least from the practical standpoint.

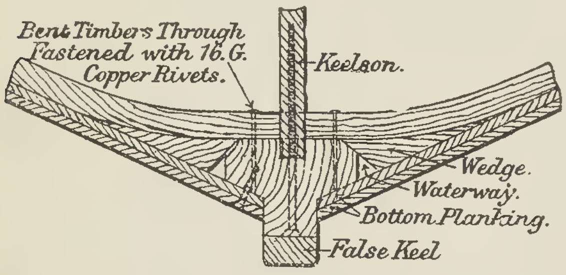


FIGURE 1

The larger of the flying boats are dealt with principally, known officially as F.2A, F.3, F.5, P.5, N.4. Of these the F.2A has the smallest hull, which measures 42 ft. 6 in. in length and 10 ft. in breadth, and is 2 ft. 6 in. shorter than the F.3 and F.5 types. The P.5 and N.4 types, patented by Major Linten Hopen, are of circular section with fair and easy lines. They offer much less air resistance, and consequently with the same horse power are driven at higher speeds.

Earlier types of flying boats were found to fail in various places. One design had no less than four consecutive planks butted, not even scarped, on the same timber, which had a siding of only ⅝ in., the line of butts being in line with the step where the boat was naturally weakest. Another type without side fins experience difficulty in getting off, while the wire sewing of another type was found to cut into the soft cedar skin when the boat was subject to severe landing shocks.

The construction of the F type is on the box-girder principle, with four longerons running fore and aft. The keel, another fore and aft member, runs from the sternpost right around the nose to form the stern, and finishes at the gun ring. The keel and keelson combined with the floors form the backbone of the hull.

Many of these boats were found to leak badly, partly due to the bad connection between the keel and the bottom planking, and partly because the keel is too narrow. In the F.5 type the timbers are continuous from fin chine, as in Fig. 1, forming a much stronger combination. The keel was also increased in this model. The timbers are ½ by ½ in. spaced at four inches apart amidships, increasing to seven inches at the end of the boat, and are fastened to the keel by copper rivets.

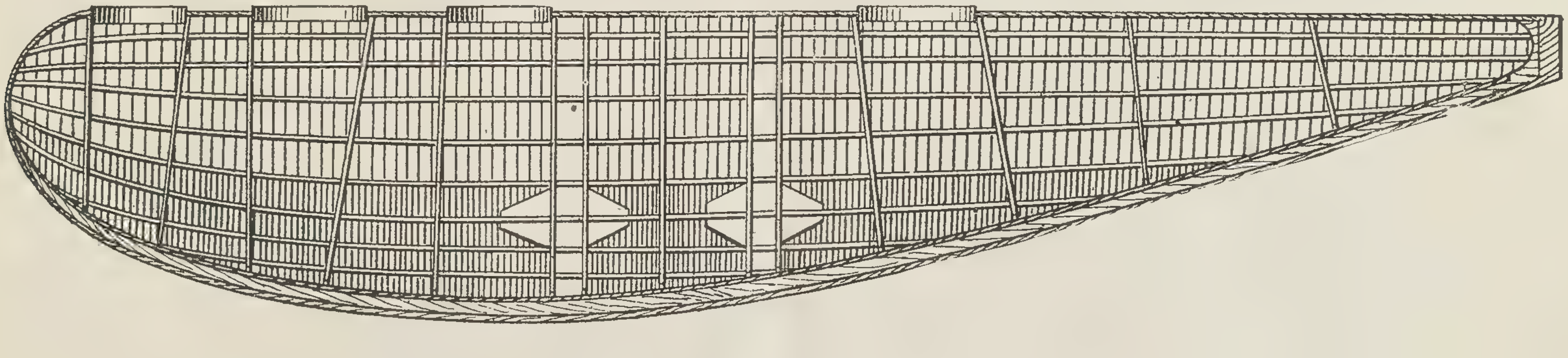


FIGURE 3

The bottom planking is arranged on the diagonal system, the inner skin being of cedar ⅛ in. thick at the ends and 3/16 in. thick amidships, fitted at an angle of 45 deg, inclination to the keel. The outer skin is of mahogany, 5/32 in. thick forward, 3/16 in. thick amidships, and ⅛ in. thick aft, the planking being at 30 deg., with the forward end of the plans butting against the keel. A layer of varnished fabric is fitted between the skins making the structure very strong. The planking is fastened together with copper nails, and to the floors and stringers with brass screws. Fig. 2 illustrates the connection of the planking with the fin chine on the later type of boats.

The timbers under the fin for the early hulls were heavy and widely spaced, but in later boats timbers ¼ in. by 5/16 in., spaced 2 in. apart were substituted to permit all through fastenings of the diagonal planking on the hard wood timbers. Two stringers, equally spaced from the fin member, run under the fin, and two other stringers placed immediately below these on the bottom are connected by ½ in. square posts placed one foot apart.

The timber at the bow is composed of rock elm, ¼ in. by ⅜ in., spaced 2½ in. centers apart, and reenforced by the horizontal stiffeners below the top longerons. Above the top longerons there are ten deck-stringers, which are notched to take the ribs, together with three strong beams which subdivide the athwartship ribs.

The deck is built and covered with fabric, and the stringers decrease to a minimum in order to keep the tail weight as low as possible. There are four bulkheads, running from the top of the floors to a few inches above the top of the fin line. The top of the bulkhead is stiffened by a capping piece of spruce.

The chief elements of the structure such as, struts, pillars, beams, floors, wing-root spars, etc., are held together by light metal fittings of about 16 B. W. G. steel.

The longerons combined with the struts and stays form the principle superstructure of the hull above the fin top. The tail of the hull is not too stiff in torsion so adjustment with the bracing wires must be carefully carried out, and all the turnbuckles must be locked. Occasionally the tails get out of alignment and cause a great deal of trouble.

The wing root spars are among the most important members of the structure. They not only carry the weight of the wings but they also support the engines. When the machine is in the air the hull is suspended from the wing root spars, it is, therefore, most important that they should be of the finest and best material available.

At midships, where the gasoline tanks are stored, the floors are shaped to take the tank stools, and are especially stiffened and built up at the sides to form the tank cradles.

Accommodation for a gunner is located immediately below the fore gun ring, and a table for his use extends from his seat to the nose of the hull. Abaft this seat is the station for the pilot and assistant pilot, so arranged as to give a proper lookout.

Generally the hull construction of the P and N types consists of a number of stringers disposed, as in Fig. 3, around the more or less circular section of the boat. This construction is very simple. There is a saving of 29 per cent, in bare hull weight in P 5 over the latest hulls of the F 5 class which are of the same length and power. The cost of production compares favorably with the F type boats, but the P type can be computed with extreme accuracy. On one occasion the actual weight of a hull differed by only one-half per cent from the estimated weight and the center of gravity was exactly as designed.

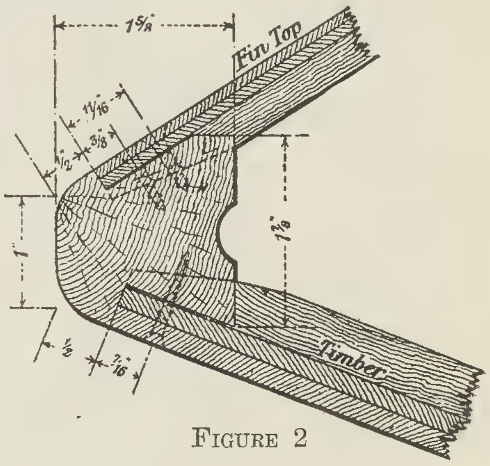


FIGURE 2

In a flying boat it is necessary for efficiency that it should possess:

(a) A minimum weight of hull consistent with strength.

(b) Seaworthiness.

(c) A minimum hull resistance.

Hollow "V" sections keep the spray down, cut the water more easily, plane better, reduce shock on landing or when ploughing through broken water, and eliminate the necessity for shock absorbers. The bottom of the hull forward should be inclined to the axis of the machine, but the inclination should not be so great as to cause planing before the controls become effective. Aft, the bottom should rise quickly, as this favors a steepening of the planing bow before the suction is eliminated.

The F boats are propelled by two Eagle-Royce engines, each developing 345 h.p., giving a speed of 100 m.p.h. There is no dihedral or stagger and the span is 102 ft.

The N boat has an overall length of 70 ft., carries a crew of nine, and 1,000 gallons of fuel. Her wings are of the variable camber device, and the span is 142 ft. She is fitted with two Rolls Condour engines, each giving 640 h.p., and has a sea-level speed of 110 m.p.h., while her ceiling is 18,000 ft.

Miraculous Escape of the Navy Airship B-12

Unusual Story of Adventures of Dirigible Given Up as Lost Off the Atlantic Coast During Submarine Scare a Year Ago

An unusual story of hardships, daring, and miraculous escape from death during the war was brought to light for the first time when naval officers made public an account of the adventures of the crew of the Navy airship B-12, which was given up for lost by the department in July, 1918, after drifting around at sea for more than two days, during which the crew had practically nothing to eat and ran short of drinking water. The dirigible finally was forced to descend on the surface of the sea, and the crew was rescued by the Swedish ship Skagern.

The B-12, with Ensign W. B. Griffin as commanding officer and pilot, Ensign W. C. Briscoe as assistant pilot, and Machinist's Mate E. A. Upton as mechanic, was ordered to leave Chatham, Mass., early July 19 on a patrolling expedition. German submarines were then operating off the Atlantic Coast, and the dirigible was well loaded with bombs when it left the air station. Scanty food supplies were carried, as Ensign Griffin expected to return to Chatham that night. The radio equipment had been only partly installed and could not be used to send or receive messages.

The B-12 patrolled to the north along the coast and sighted a transport about 3.30 p. m. Ensign Griffin headed toward the vessel, intending to escort it toward port, when the heel brace on the rudder was carried away, making it impossible to steer craft. High winds were prevailing at the time, and the B-12 was forced to cruise around in a great circle while the crew attempted to attract the attention of several ships and two seaplanes then in sight. No attention was paid to repeated signals, and finally Ensign Griffin ordered the motors cut off in order to save the gasoline for ballast.

The B-12 was at that time about 200 feet in the air, and was virtually a free balloon. Darkness was coming on, and the big gas bag was drifting northward at a speed of about twenty-five miles an hour, with an increasing wind behind it. A sea anchor was rigged up and an effort made to retard the dirigible's progress by dragging it in the sea. After a few moments, however, the towing cable parted, and the northward progress was resumed at an increased speed.

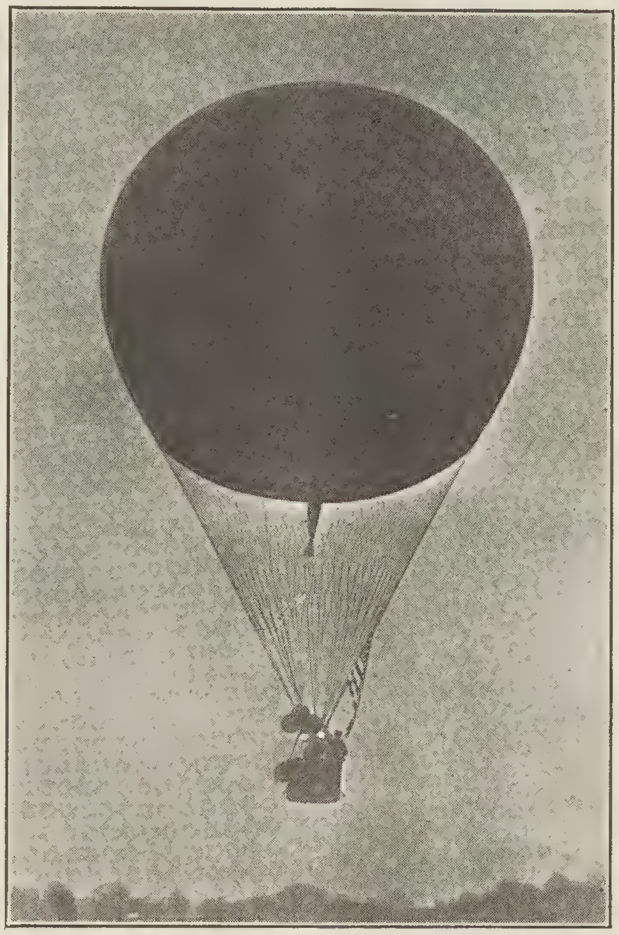
About 9.30 o'clock that night a ship was sighted and nine rockets were fired from a pistol. The vessel apparently saw the signals, and directed its course toward the B-12, only to turn away in a few moments and leave the helpless gas bag to the mercy of the wind. About that time the pipe line leading to the emergency oil tank broke, and before the leak was discovered all of the oil was lost, causing a considerable decrease of ballast. The B-12 began to rise and ascended steadily until an altitude of 3,000 feet was reached.

All night the dirigible continued its wild dash northward, the crew meantime consuming the small amount of food aboard. Ensign Griffin had no idea of his whereabouts.

Early on the morning of the second day the gas bag buckled and the horizontal fins dropped to a vertical position. Throughout that day the dirigible alternately dropped until perilously near the sea and ascended to altitudes of more than 2,500 feet. Every available article was thrown overboard during these variations in altitude to keep the airship from plunging into the ocean. Not a vessel was sighted that day or that night. The crew meantime was beginning to suffer from hunger.

On the morning of the third day of the involuntary cruise, the sun shone brightly, and, as the gas in the bag expanded rapidly, the B-12 started to rise. Ensign Griffin, after a conference with the other members of the crew, decided to bring the B-12 to the surface and take a chance of being picked up. To avoid the risk of ascending to a high altitude with only a small amount of ballast aboard, gasoline, water, sand, bombs, bomb-launching gear, batteries, and the radio outfit parts were dumped overboard and the B-12 brought to the surface safely.

Soon after the descent a ship was sighted, and it directed its course toward the dirigible, the crew of which meanwhile was having great difficulty in keeping clear of the water. The vessel proved to be the Swedish steamer Skagern, bound for Halifax. A small boat was put over the side, and the crew of the B-12 was taken off. Then, as the increasing heat from the sun caused the gas to expand, the dirigible rose a few feet above the surface, was pulled over to the Skagren, the rip cord pulled, and the B-12 was salvaged without much damage more than 300 miles from its home station.



Naval Air Station Balloon 821, Which Left Akron in First National Free Balloon Contest Since 1914

(C) The B. F. Goodrich Rubber Co.

Championship Balloon Race

A balloon race for the United States championship will start from St. Louis Oct. 1. The race will be conducted by the Missouri Aeronautical Society under the rules of the International Aeronautical Federation.

The first prize will be $500; the second, $300, and the third, $200.

Airship Landing Device

Experiments are to be made by the Admiralty airship department in about a fortnight to meet the difficulties in the handling of airships, which caused such trouble at Mineola. A device on entirely novel lines has been invented whereby an airship can be landed and moored without the assistance of any one except the crew, and which will do away with the necessity for sheds.

So far the nature of the device has been kept a secret, but if it proves successful it will mark a big advance in the usefulness of airships and lessen the disadvantages that at present operate against them in the favor of airplanes.

Automatic landing and mooring are essential before airships can be put up as a commercial proposition.

Three points are being studied by the British technical departments now. One is moving the airship in the open, the second is the economy of man power required in landing, and the third the necessity for a good reserve of speed. This last is not a question of petrol supply, but of horse power and the size of the ship.

The trial trip of the R-32 recently gave from 67 to 70 miles an hour, and she has 1,550,000 cubic feet capacity.

The R-34 has 2,000,000, and on her Atlantic trip reached approximately 60 miles an hour, but this is not going to be the speed of the future airship.

Major Scott, before he sailed, said he had no doubt that 100 miles an hour with proportionate "dispersal" lift, which is 50 per cent of the actual lift, would be obtained from airships that would be built with a capacity of 5,000,000.

Unless the size of the airship is increased, engines for this higher speed cannot be fitted, so that the experiment which the Admiralty is going to carry out will be vital to the commercial interests of the future.

Pomilio Monograph

A monograph, dignified in tone and beautifully produced, has been published by the Pomilio Brothers Corporation, 501 Fifth avenue, New York, to illustrate the principal types of planes perfected and designed by the Pomilio Brothers at their aviation works in Turin, Italy.

The cover of this week's Aircraft Journal is from this beautiful work.

Commercial Air Service

Airplane passenger and delivery service between New York and Boston is announced by the National Air Service, 500 Fifth Avenue, New York.

The new service is being conducted by Lieut. Frederick J. Knob, formerly of the U. S. Marine Corps, and Lieut. Mark C. Hogue, of the Army Air Service. Arrangements have also been made for stops at Bridgeport and New London, Conn., where good landing fields are available. A number of successful flights have already been made.

Passenger-carrying and commercial flights to other points are contemplated by the National Air Service, which intends to conduct a general airplane business throughout the United States.

Flying to Summer Resorts

An aerial passenger and parcel service between Albany and Saratoga and Lake George is scheduled under the direction of the Adams Aerial Transportation Co., and will be continued throughout the summer. Seaplanes will be used, and James L. Wheeler, formerly a United States Navy air pilot, will be in charge. Associated with him is Marshall Lentz. Passengers from New York and other points by the Hudson River night boats will be met at Albany by Mr. Wheeler and his seaplane, and may continue their journey to Saratoga Lake or Lake George by air route. Small packages also will be transported.

This is the first aerial transportation service to be established in this State, and follows the successful experimental flight from New York to Albany, two weeks ago, with stops at Newburgh, Poughkeepsie and Hudson on the way, and which demonstrated the practicability of such an aerial service.

Studying Upper Currents

A balloon ascension to study upper currents and meteorological conditions over Nebraska, Arkansas, Missouri and Mississippi under influence of the great rivers, was carried into effect recently from the United States Army Balloon School, Fort Omaha, Nebraska.

Two 35,000-ft. hydrogen-filled balloons started at the same time. One was to maintain an altitude of 5,000 ft.; the other 10,000 ft. The idea was to find out the difference in air currents at these levels in regard to direction and intensity.

The experiment was started at 10:30 P. M., Lieut. Col. Jacob W. S. Wuest, commanding officer of the Balloon School, with Lieut. Francis A. Reynolds leading off for the 5,000 ft. elevation, and Capt. Frank W. Goodale and Lieut. Clarence L. Meisinger following ten minutes later for the 10,000 ft. elevation.

The balloons passed southeast over Omaha in a 40-mile wind, and succeeded maintaining the elevations as planned during the entire night. The morning sun caused sudden gas expansion and rapid ascent to 12,000 ft. and above which was varied by cold ascending currents from valleys of Ozark Mountains, over which the balloons passed.

Lieut. Col. J. W. S. Wuest's balloon, maintaining lowest elevation, landed at 2:30 in the afternoon near Little Rock, Ark., 500 miles, having been in the air 16 hours. Capt. Goodale's balloon, maintaining 10,000 ft., landed at 1:30 P. M. at Arcola, Miss., 600 miles, having been in the air 15 hours, the speed being faster at the higher elevation. The upper currents confirm the theory of meteorologists in running parallel to isobars. Other scientific data is in course of preparation from notes taken on the voyage.

British Linen Sale

The British Government sale of 40,000,000 yards of airplane linen to Leonard J. Martin for $10,000,000 has caused much discussion, and no doubt the Government will be pressed for information. In some quarters it is assumed that there is a big syndicate of financiers behind Martin and that it is hoped to export most of the material. Another suggestion is that Martin is acting on behalf of the Government, thus creating a corner in linen.

The Belfast linen manufacturers who profess to be unconcerned about the deal say that the airplane linen is unsuitable for most articles usually made of linen, that Martin is bound to lose heavily in the transaction, and that he made a bad bargain. At the same time they complain that the Government has not dealt fairly with them.

The *Daily News,* in giving the Government's view of the transaction, points out that, when, in 1917, a greatly enhanced program of airplane construction was decided on, the Government was faced with the difficulty of increasing its output of airplane linen, which then was about 150,000 yards a month, the price paid being 4 shillings a yard. The Government took drastic measures to develop the growth of flax in England and Ireland, with the result that at the date of the armistice the linen output had increased to 7,000,000 yards a month. The cessation of hostilities threw 50,000,000 yards of the fabric on the Government's hands. The disposal board set up by the Government tried to induce the linen trade to buy back the linen, but the Belfast manufacturers refused to offer more than a shilling a yard. They did, afterward, come forward with a counter-proposal for a profit-sharing scheme with the Government under which they would have borne 25 percent. of any loss on sales below 13 pence a yard and would have taken 25 per cent. of any profit on sales over 13 pence a yard. This offer was refused by the disposal board in the interests of the taxpayers, it being pointed out that if it had been accepted and if the linen had afterward been sold by the trade merely at the price now paid by Martin, which is 20 pence a yard, the Belfast traders would have netted over $1,500,000 of the money now paid to the Government.

Moreover, under the terms of the Belfast proposal, there was no guarantee that a single yard would be sold.

Flies From Convention

Maintaining an average speed of 103.3 miles an hour, in spite of a direct head wind, all the way east from St. Louis, Charles F. Kettering, president of the Dayton Engineering Laboratories Co., returned home July 19 from a convention at Wichita, Kan. His De Haviland machine, piloted by Howard Rinehart, landed at South Field, Dayton, this afternoon at 3:15, having covered 800 miles in seven hours and forty-five minutes.

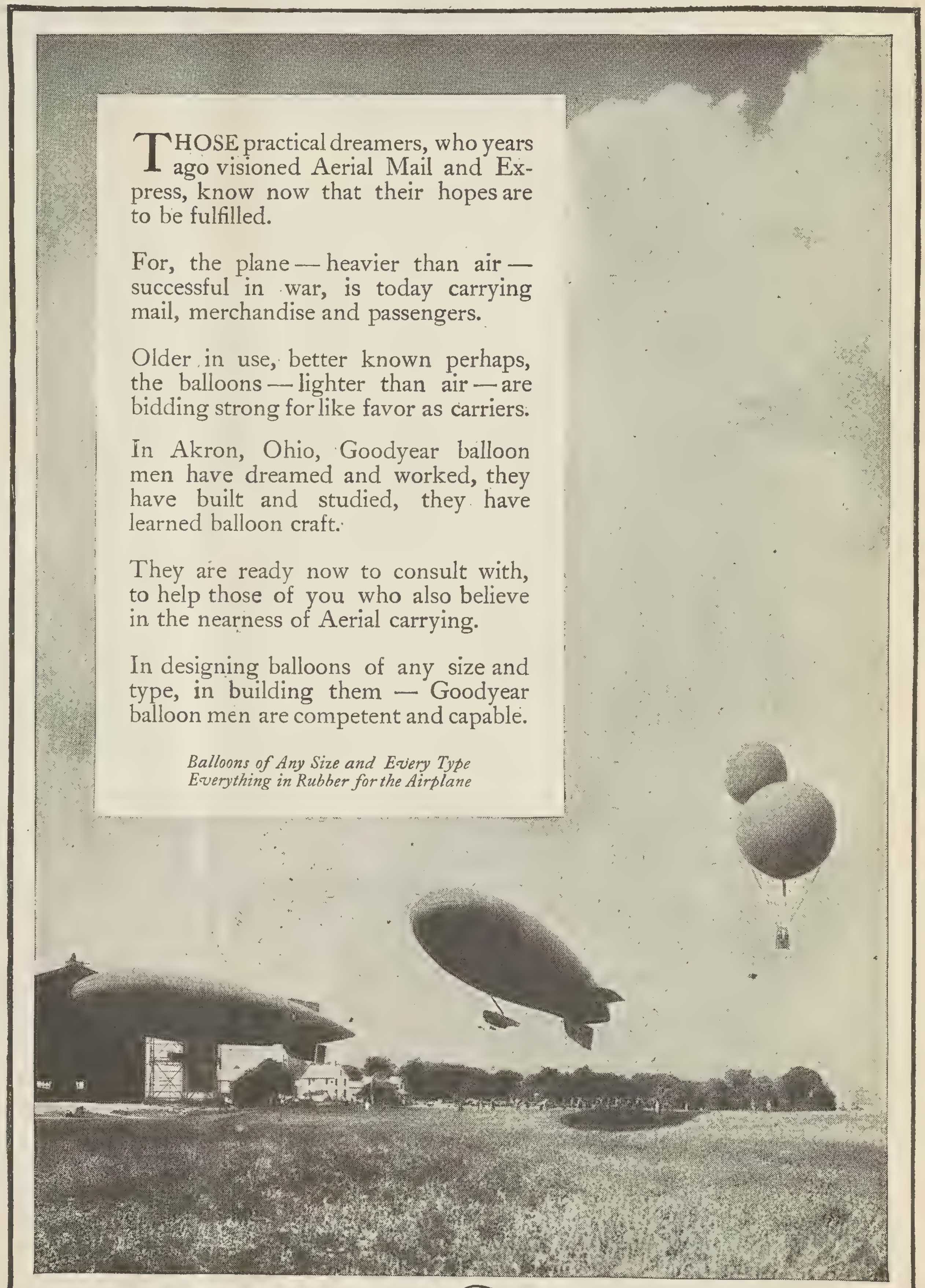
Flying Boat Lands at Night

A Curtiss Sea Gull flying boat recently made the first night landing between New York and Atlantic City.

When the mechanics finished setting up the boat it was almost eight o'clock, but, in order to get it to Earle L. Ovington, manager of the Curtiss Flying Station at Atlantic City, on time, Orton W. Hoover, one of the Curtiss pilots, left Port Washington hangars at 8:15. He started by moonlight against a heavy head wind, which made it necessary for him to land near Beach Haven for fuel.

Steering by means of a beach-fire, Pilot Hoover landed the boat safely upon the sand and, after procuring gasolene, he again made a take-off with the assistance of bathers, headed the Sea Gull out to sea, took the air and made Atlantic City at 11 o'clock. The Sea Gull is the new three-passenger flying boat equipped with the Curtiss 150 horsepower motor.

Hoover, an experienced pilot, took along as passengers Mr. and Mrs. C. R. Keys of the Curtiss Engineering Corporation.



THOSE practical dreamers, who years ago visioned Aerial Mail and Express, know now that their hopes are to be fulfilled.

For, the plane — heavier than air — successful in war, is today carrying mail, merchandise and passengers.

Older in use, better known perhaps, the balloons — lighter than air — are bidding strong for like favor as carriers.

In Akron, Ohio, Goodyear balloon men have dreamed and worked, they have built and studied, they have learned balloon craft.

They are ready now to consult with, to help those of you who also believe in the nearness of Aerial carrying.

In designing balloons of any size and type, in building them — Goodyear balloon men are competent and capable.

Balloons of Any Size and Every Type
Everything in Rubber for the Airplane

GOODYEAR
AKRON

Balloon Watches Forest

The first all night flight of an observation balloon in America is the record of the Ross Field, Arcadia, Cal., observers in cooperation with the forestry service in Southern California.

On account of the extremely dry weather this was considered necessary and thirty miles of the Sierra Madre mountain forest reserve was carefully watched throughout the night.

Lieutenants Donald C. Cathcart of Sheldon, Iowa, Adjutant of the post and Norman E. Galentine of El Paso, Texas Field Balloon Officers were the pilots and observers and were in the balloon seventeen hours maintaining an elevation of 1500 feet. Tests were made on signalling, map reading and lifting power of gas. Lieutenant Cathcart has had more hours in the air than any other officer.

The possible acreage that could be brought under the protection of an aerial forest fire patrol is estimated at 90,000,000 as follows:

Arizona	5,000,000
California	25,000,000
Colorado	10,000,000
Idaho	5,000,000
Michigan	1,000,000
Minnesota	5,000,000
Montana	8,000,000
Oregon	15,000,000
Washington	15,000,000
Wisconsin	1,000,000
Total	90,000,000

Gasoline Air Turbine

According to Essen dispatches to Swiss newspapers, German manufacturers, after lengthy experiments, have succeeded in creating a gasoline turbine. The engine, it is asserted, will enable an airplane to fly virtually without noise.

The dispatches add that several airplanes fitted with the new engines are being constructed. They will have a capacity of sixty-four passengers each.

Sea Gull in Scandinavia

Lost in the darkness and forced to alight on the Baltic Sea, where they tossed about for several hours before being picked up by a fishing schooner, was the experience of John M. Larsen of New York City and Carl T. Batts, former United States Air Service pilot, who are touring the Scandinavian countries in a Curtiss "Seagull" flying boat.

In a letter received from Mr. Larsen, who is distributor for Curtiss flying craft in the Scandinavian countries, he states that while flying from Copenhagen, Denmark, to Stockholm, Sweden, a distance of approximately 400 miles, he was overtaken by a storm and, in the darkness, lost his way. Batts, who was acting as pilot, landed the small craft on the sea, and it weathered the waves until morning, when they were sighted.

The flying boat used was the Curtiss "Seagull," which was exhibited at the Aero show in New York in February. It was shipped to Mr. Larsen at Christiania in April, and since that time it has been flown more than 2000 miles, one trip of 400 miles being overland from Christiania to Stockholm, following a chain of lakes. It is equipped with one of the new Curtiss K-6 150 hp. motors developed during the war.

An Airplane Elopement

Miss Orpha Jane Arnold, daughter of a wealthy farmer and oil operator in Larned, and Lieut. Warren P. Kite, who was an instructor at Kelly Flying Field in the war, eloped in the lieutenant's airplane recently. After a ride of seventy-five miles through the air they were married at Hays, Kan. The couple had known each other for nine days, and E. E. Saegesser, who accompanied them to Hays, had no idea that they were to be married when they started the flight.

The couple will live in Springfield, Mo., the home of Lieut. Kite.

Toronto to N. Y.

Seventeen entries and $10,000 in cash prizes already are assured for the airplane flights from Toronto to New York, which are to feature the Canadian National Exposition to be opened here by the Prince of Wales August 25, it is announced.

All entries are from the United States, but twelve Canadian entries are expected before the exposition opens. Captured German Fokker planes, now in the possession of the Dominion government, will be admitted to the contests, it has been decided, provided their pilots hail from allied countries. There are twenty-two of these craft in Toronto now.

Pinched by an Air Cop

From Los Angeles comes the story of the first successful use of an airplane to overhaul and arrest an automobile speeder. A motor cycle officer tried to overtake a speed maniac going at sixty miles an hour or thereabout in one of the suburbs of the city. He was forced to stop due to engine trouble, but being near a commercial aviation field and being an air pilot himself he obtained the use of an airplane and went after the offending motorist at the rate of ninety miles an hour. He made a good landing two miles ahead of the motor culprit and the latter, slowing down, thinking the pilot was in trouble, was coolly informed that he was under arrest. It was the first case in the court records there of an arrest for automobile speeding by airplane.

Germans Plan Service

A dispatch to the *Ekstrabladet* from Berlin announced that a German company was planning a regular passenger and cargo airship service between Berlin and Odense (a Danish seaport), Copenhagen and Stockholm.

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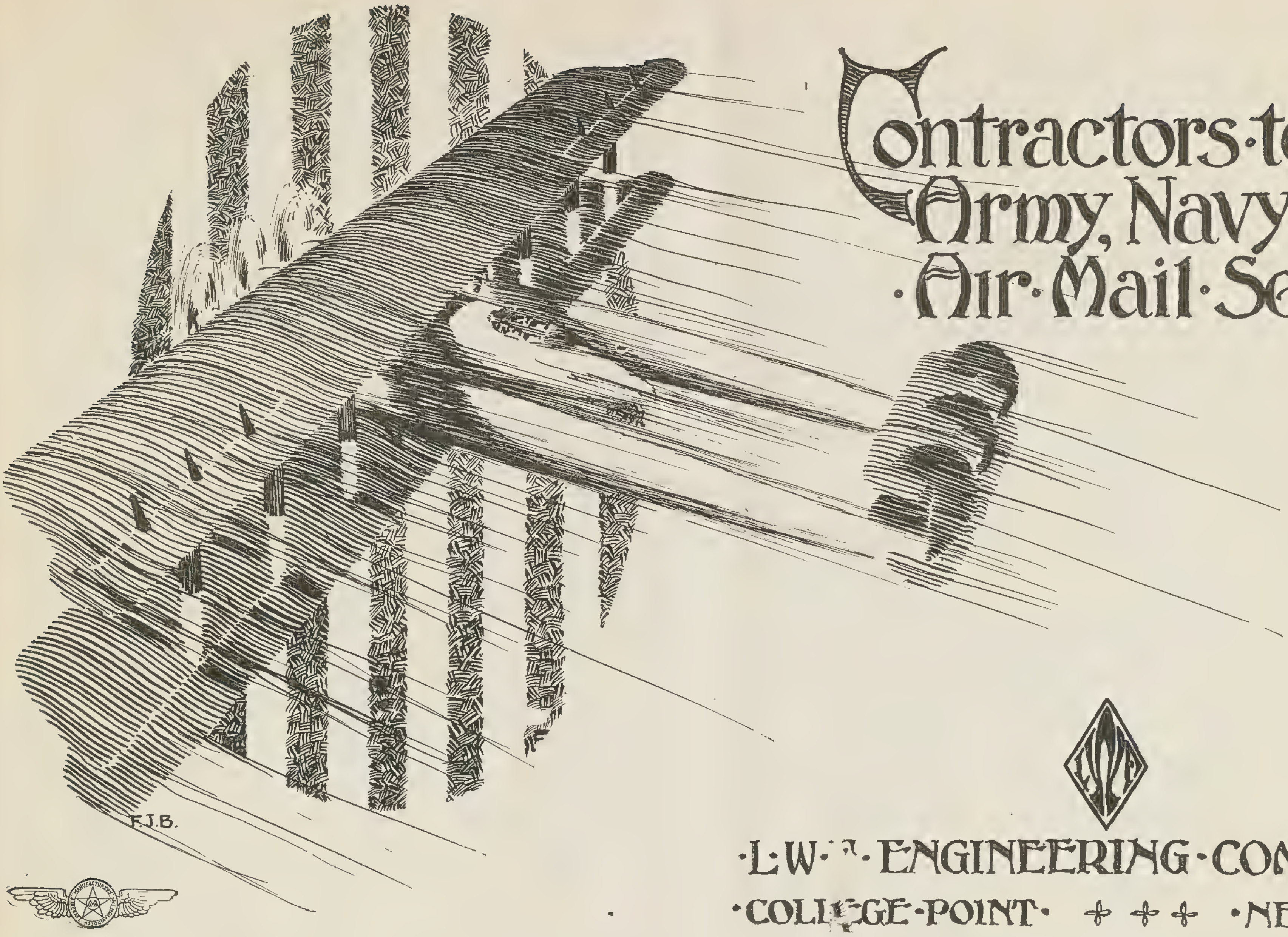

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Deliver Clothes by Plane

It may seem fanciful, observes the *Clothier and Furnisher* for July, but it is a fact that one of the large clothing manufacturers has started an airplane delivery service to his customers. And he insists that he is seriously in earnest, and that it is not meant as a publicity move, and has no connection whatever with advertising. Furthermore, he has had the scheme in mind for at least five years, and only the war prevented its earlier consummation.

The manufacturer with this vision is Alfred Decker, of Alfred Decker & Cohn, of Chicago. He started his airplane delivery some days ago to customers in the neighboring cities of Champaign and Kankakee. The first deliveries were successfully made, and moreover the aviator brought back with him to Chicago the first "aerial shopper," in the person of a lady from Champaign.

Mr. Decker appears to have gone about this move in a thoroughly business-like manner. Long before the war he communicated with Orville Wright on the subject, and was assured that the airplane had not been developed to the point where such service could be successful. As soon as the war was over, realizing the great advance in the art of flying that had been made, Mr. Decker took the matter up again. He engaged a pilot who had been in military service bought a couple of Curtiss JN planes, the type which had been used for training aviators acquired a plot of ground at Maywood, a suburb of Chicago, which he had prepared as a landing field built a hangar, engaged mechanics, and in fact gave every indication of being in deadly earnest. At last the day arrived when all was ready, and with the appropriate ceremonies the first deliveries were sent out. The plan was to make the first flights three times a week in a radius of 200 miles, gradually expanding the service to a six day a week schedule, with a radius of 600 miles.

The plan has worked without a hitch, and its progress is being watched with interest.

By Air to a Reunion

C. S. Jones, Curtiss pilot, who recently made a trip from Garden City, L. I., to Middlebury, Vt., with Ralph H. Mann, a Worcester, Mass., banker, as passenger, to attend his college reunion, covered 600 miles, the actual flying time being nine hours.

Jones, who is also an alumnus of Middlebury, took a trip to Burlington, Vt., recently. It was the first time that an airplane had ever circled over the city, and it attracted considerable attention.

"The country between New York and Poughkeepsie is only fair for flying," said Mr. Jones. "Beyond Poughkeepsie and as far as Middlebury it is excellent. Poughkeepsie, Albany and Glens Falls all have high-test gasoline stations, and at each of the cities there is great interest in aviation. There are landing fields at all three cities, and Glens Falls is planning a new municipal field. The municipal field at Albany ought to be one of the finest in the country."

The First Seaplane

Glenn H. Curtiss is the inventor of the flying-boat. An interesting story is told of how he came to invent the hydro-airplane, which is the forerunner of the flying-boat, the latest development of which is the NC-4, which was built for the Navy at the Curtiss plant at Garden City, L. I.

Mr. and Mrs. Curtiss were attending one of the performances at a New York theatre during the time that he was working upon new experiments, and while apparently enjoying the performance, and during one of the most interesting climaxes, Mr. Curtiss said, audibly enough to be heard by many, although the remark was intended for his wife. "I've got it!" On his program he had sketched roughly what became ultimately the design of the seaplane.

Future Naval Battles

The naval battle of the future was pictured by Admiral William S. Sims in an address at the alumni banquet of Yale University in New Haven recently. He said:

"Under present conditions fleets will open fire at ten miles or more. The guns may totally destroy a great ship with a single shot. Scores of rapid destroyers will launch torpedoes that have a range of more than five miles. Airplanes will launch similar torpedoes. Other planes will drop bombs of great size, weighing 3000 lb., and still others will control by wireless super-torpedoes carrying an explosive charge of more than one ton. Fleet submarines may be present in great numbers, and many automatic mines may be laid in front of the fleets."

Boxing in the Air

The army is arranging for the encouragement of the recruiting campaign an up in the air stunt wilder than any press agent ever dreamed of—nothing less than a sure enough boxing bout in an airplane. The boxing match above the earth will take place over Camp Dix, providing the New Jersey State Boxing Commission enters no objection, though how far above the earth the authority of the commissioners may run is a question.

Lieut. John S. Donaldson of the First Pursuit Squadron challenged all comers to meet him with gloves. The challenge was accepted by Lieut. Leroy M. Wightman, a machine gun officer handy with the padded mitts. The boxers will be belted within a tiny ring in the fuselage of an Army bombing plane so that there will be no danger of a plunge to earth in case of a knockout. The flying ring will be driven by Sergeant John Moore, and it is planned to have the referee and timers in another plane that will keep alongside the boxers' plane so that they can judge the points and time the rounds.

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3. Property Damage (damage to property of others)

Additional coverage may be had against loss by windstorm, cyclone or tornado.

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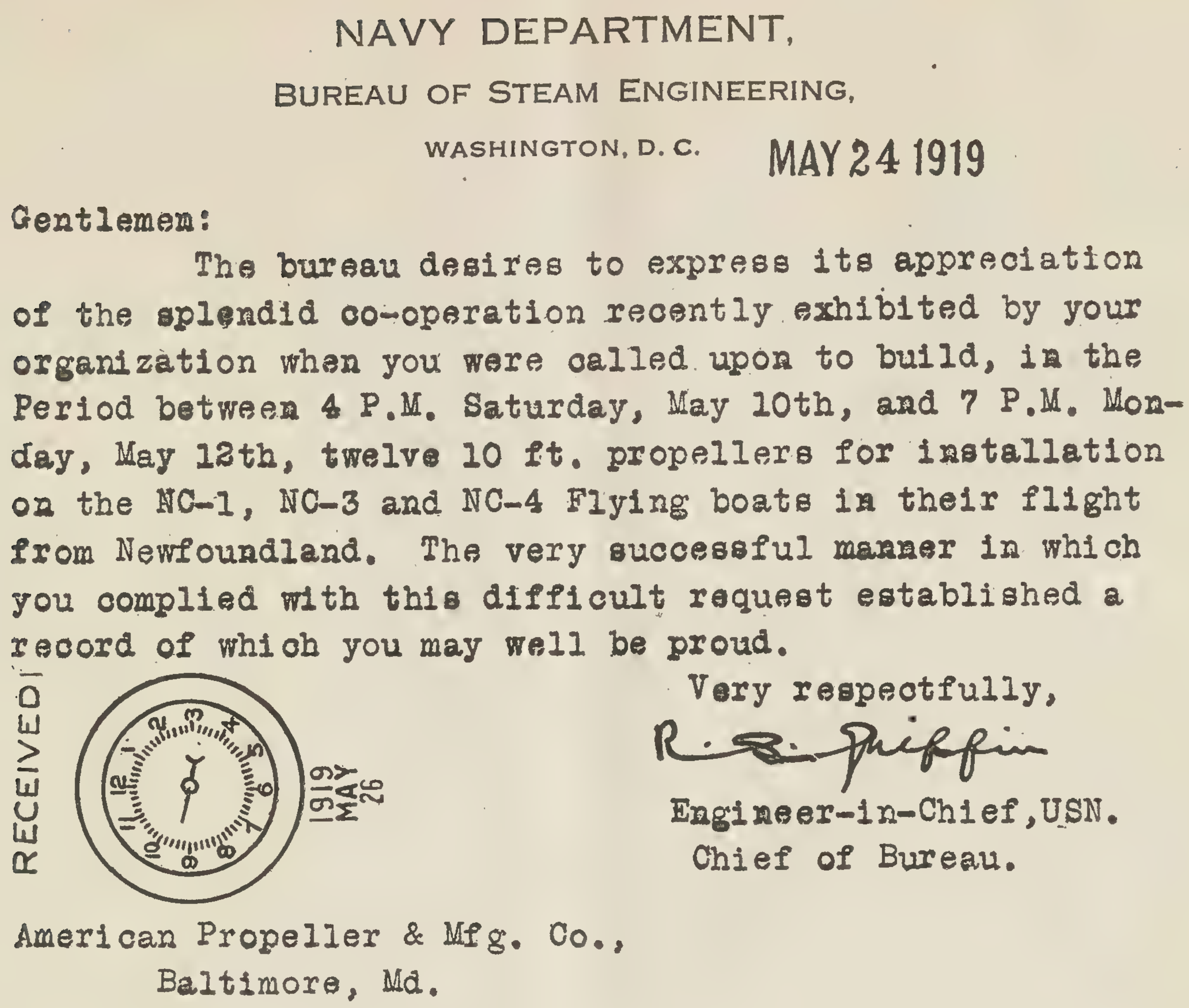

NAVY DEPARTMENT,

BUREAU OF STEAM ENGINEERING,

WASHINGTON, D. C. MAY 24 1919

Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

RECEIVED 1919 MAY 26

Very respectfully,

R. S. Griffin

Engineer-in-Chief, USN.
Chief of Bureau.

American Propeller & Mfg. Co.,
Baltimore, Md.

Thomas

THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
ITHACA, N. Y. U.S.A.

San Francisco Air Port

(*Continued from page 4*)

nental passenger service; pacific coast passenger service; Sacramento and Mather Field service will be increasingly heavy; El Paso, Salt Lake City, Denver and Interior, California city passengers for San Francisco; transpacific dirigibles; reserve flying services and flying clubs; privately owned aircraft; interbay cities traffic.

"There should be a concerted effort to make San Francisco the chief Pacific Airport and Terminal of the Transcontinental air routes.

"SOME CITY ORGANIZATION.

"It is suggested that consideration be given to the establishment of some city organization, perhaps a San Francisco Aeronautical Association, that shall be fully representative of all interests, in order that the full force of the city may be focussed in development work. Such a body should be representative of mayor and supervisors; chambers of commerce; army; navy; Post Office; resrve flying officers; aircraft builders; aircraft distributors; Commercial air services; Pacific Aero Club; Commercial and business clubs; California Federation of Labor; Advertising Club; Foreign Trade Club; San Francisco newspapers, etc.

"The objects of such an association might be, generally, to:

Cooperate with Government, Army, Navy and Post Office in the provision of proper accommodation for aircraft.

Survey possibilities of establishing an airport worthy of San Francisco.

Cooperate with other bodies, national and State, in routing traffic.

Make recommendation as to air laws, and stimulate movement to avoid such a chaos of interstate laws as hindered railroad administration.

Get in touch with all firms throughout the country that are interested in transcontinental air service, with a view to rendering aid.

Make recommendation as to the adoption of the Marina or any other suitable site for principal landing place.

If municipal bond issue be necessary to help flying development, to prepare public education, etc. Consider advisability of securing for San Francisco first Pacific Coast Aeronautical Exposition, similar to one recently held in New York, where all latest types of ships were shown. Government would cooperate.

Such an exposition would help movement to establish an airport.

Advisability of calling Pacific Coast Air Convention for discussion of regulations and stimulation of traffic in the States west of Chicago.

Possibly extend an invitation to British government to send the R-34, or some other big dirigible that will soon be in regular service, on a courtesy trip to San Francisco.

Stimulate enterprise in Transcontinental and Transpacific and local flying by securing money prizes for competition.

And generally to take cognizance of and function, as officially representing the city, in all matters aeronautical.

LORING PICKERING.

D'Annunzio in Long Flight

Gabriele d'Annunzio, poet and aviator, has arranged to attempt a flight from Rome to Tokio and return. The trip will last altogether a month and the aviator purposes to cover about 20,000 miles.

The route will extend through Asia Minor, India, Tongking and China to Japan. D'Annunzio has arranged for stations along the route where he can replenish his supplies.

The Italian Government has offered Gabriele d'Annunzio the post of Director-General of Civilian Aviation.

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Refer to Section 10

Answers to Correspondents

All bona fide inquiries will be answered by letter to the inquirer and included in these columns. Questions should be accompanied by stamped addressed envelopes.

J. W. C.—Will you kindly give full description of the R. A. F. 6 wing curve, mentioned in your description of the "NC-1" in your issue of June 1, 1919.

The description of the R. A. F. 6 follows:

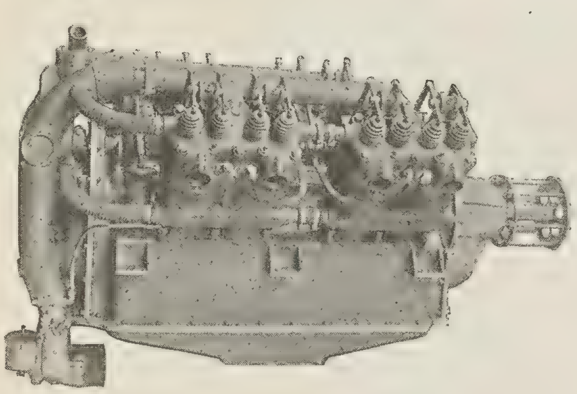
Chord 100

Distance from leading edge	Distance of lower surface above chord	Distance of upper surface above chord
0	0	.5
5	0.2	4.4
10	0.4	6.0
20	0.7	7.4
30	0.8	7.6
40	0.7	7.5
50	0.5	7.1
60	0.4	6.5
70	0.3	5.7
80	0.2	4.4
90	0.1	2.7
100	0.0	0.5

Aspect Ratio 6

i	Ky	Kx	L/D
—4	.00043	.000145	....
—2	.00006	.000105	.6
—1	.00028	.000091	3.1
0	.00053	.000081	6.6
1	.00081	.000076	10.6
2	.00110	.000078	14.1
3	.00134	.000083	16.2
4	.00155	.000095	16.3
6	.00193	.000128	15.0
8	.00229	.000170	13.5
10	.00267	.000218	12.3
12	.00301	.000270	11.1
14	.00319	.000330	9.8
16	.00292	.000573	5.1
18	.00268	.000780	3.4

A. N.—The subject has not yet been standardized sufficiently for books to exist on the construction of planes. I could refer you, however, to Camm's Airplane Construction.



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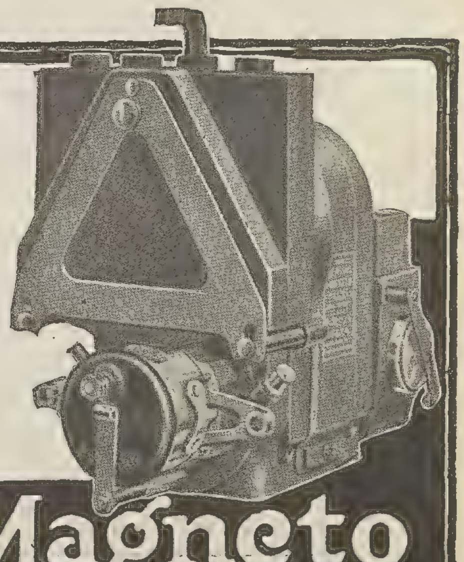

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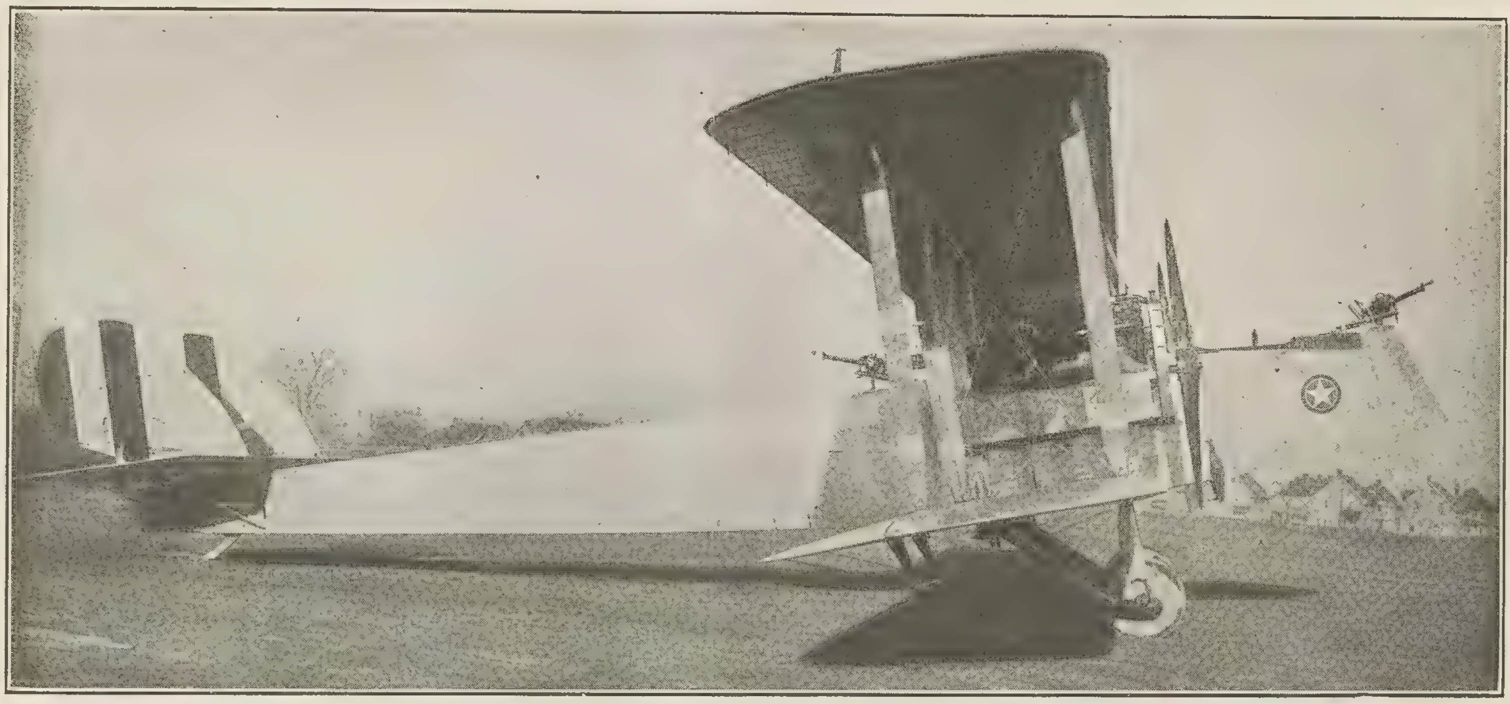
Loughead Seaplane in the Clouds



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Air Service Will Be Protected

Secretary of War Declares Department Will Endeavor to Maintain Personnel

The Army Air Service, the development of which has been interfered with by Congressional reduction of appropriations from $83,000,000 to $25,000,000 will be protected from complete disintegration, declared Newton D. Baker, Secretary of War, before the House Committee on Military Affairs last week.

During the discussion, committee members pointed out to the Secretary and the Chief of Staff that the general army order providing for the discharge of all National Army and reserve officers was largely responsible for what several Army officers have recently termed the "junking of the Air Service," and Mr. Baker promised that efforts would be made to induce many of the Army fliers who are nearly all National Army or emergency officers to accept commissions in the regular establishment so that the present personnel will not be disorganized.

Acting upon a suggestion made by Representative Anthony, Republican, of Kansas, Secretary Baker agreed to fill 11,000 vacancies in the infantry branch of the service with men now in the aviation service. Later, if the programme suggested is followed, Congress will provide authority by which another transfer back to the Air Service can be made by the War Department.

On Monday the Senate passed a bill, introduced by Senator Wadsworth, authorizing the War Department to retain 8000 emergency officers in the current fiscal year. Thus a constructive step was taken toward saving the Air Service from extinction.

Legislation passed previously authorizes a commissioned personnel of 10,000, leaving only 222 officers in the Air Service after Sept. 30. Other special branches and corps of the army were hard hit by the reduction in the commissioned personnel authorized in the Army Appropriation Bill, and they will be given additional officers under the Wadsworth bill, provided the House concurs in it.

Chairman Kahn and members of the House Military Committee invited Secretary Baker to submit a definite proposition for specific legislation to take care of the commissioned personnel. If the House authorizes the retention of 8,000 emergency officers until June 30 next, the Air Service will be sure of well over 1000 officers and the vitally important technical engineering section will be kept intact.

Beats Mail 11 Days

The R-34 beat the regular mail service by 11 days on its return trip to Great Britain

Air Mail for Adriatic

The date of the first delivery of delayed mail to ships at sea outward bound from New York by the postal air service, as described in last week's AIRCRAFT JOURNAL, has been set for some time between August 9 and August 15. C. J. Zimmerman, pilot, will follow the Adriatic in an Aeromarine flying boat, two or three hours after she has sailed for England, and, overtaking her, will drop a mail bag with a wooden float attachment into the sea just ahead of her bow.

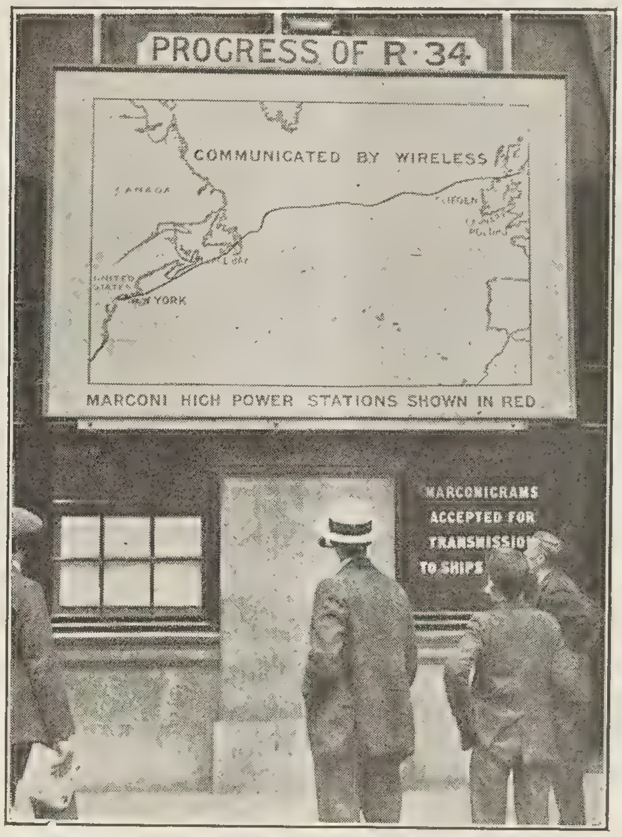
Postmaster Patten, of New York, in making the announcement, said that the device of the wooden float will remove possibility of loss of the mail and will not delay the ship. The mail will be carried in separate buoyant bags inclosed in the regulation pouch. The pouch will be made fast to the float by a rope.

Sailings of vessels are frequently delayed because of the late arrival of mails, and requests for this extension of the mail service have been made by the Merchants Association, the Fifth Avenue Association and other organizations.

Overhauling the NC-4

The NC-4, according to reports, will be overhauled at the Rockaway Air Station and will shortly go on a recruiting trip in charge of the crew that made the first trans-Atlantic flight.

The trip will be along the Atlantic Coast and possibly up the Mississippi River.


PROGRESS OF R·34
COMMUNICATED BY WIRELESS
CANADA
UNITED STATES
NEW YORK
MARCONI HIGH POWER STATIONS SHOWN IN RED
MARCONIGRAMS ACCEPTED FOR TRANSMISSIO TO SHIPS

AVIATION INTEREST IN GREAT BRITAIN

(c) *Western Newspaper Union.*

Strike R-34 Medallions

The shipment of platinum brought to this country by the British dirigible R-34 will be used in making medallions commemorating the historic trip of the airship, according to Dreicer & Co., of New York, to whom the metal was consigned.

The shipment is on exhibition in the window of the firm's store on Fifth Avenue.

Fast Mail Performance

One of the new Curtiss HA mail machines, built by the Curtiss Aeroplane and Motor Corp., for the Post Office Department, recently broke all flying records between Belmont Aerial Mail Station, New York, and Belefonte, Pa., one of the legs on the newly completed aerial mail route between New York and Chicago. The journey of 220 miles was made in 105 minutes, including a stop of ten minutes. The previous record was held by one of the DeHaviland mail machines.

Pilot Stevens, who flew the ship, stated that the machine averaged 120 miles per hour over the course, which is, for the greater part, over mountainous country. The HA machine was designed by the Curtiss Company and built around the Liberty engine. It has a mail carrying capacity of 900 pounds and, in a test performance, attained a speed of 145 miles per hour with a full load. It has a landing speed of 45 miles per hour.

Air Mail Pilots Strike

The world's first air mail pilots' strike, that threatened for a brief time last week to tie up the Government air mail, was amicably settled before the week was out and the mails have been resumed regularly. The actual strike lasted one day on the New York-Washington branch of the service.

The cause of the strike seems to have been more or less of a misunderstanding, the pilots having been reported as asking the right to decline flights in questionable weather in addition to a conference concerning different types of machines, new equipment and the reinstatement of two dismissed pilots. The Post Office in a statement by Second Assistant Postmaster General Praeger declared that everything possible was being done, that pilots were not compelled to fly and that the department cannot leave the question of when to fly and when not to fly in each instance to the judgment of a dozen different aviators. If this were done, it would be impossible to operate a mail schedule with any degree of dependability and the Air Mail would have to be abandoned.

A conference following the one day strike brought about a settlement which precludes the possibility of further trouble. The department's order concerning flying under adverse weather has now also been clarified so as to permit the manager of the flying field to determine whether the pilot shall take the air when his life might be endangered. In the event the manager is not at the field as is the case when pilots make an early start, the pilot need not leave the field pending the arrival of the manager, when in his judgment flying would be unsafe.

At the conclusion of the conference, Mr. Praeger stated that the chief factor in reaching a satisfactory solution of the trouble was the fair attitude and the interest showed by the pilots and their representative and their desire to do the right thing to maintain the air mail service at the highest efficiency. For the aviators, Pilot Charles H. Anglin said he was highly pleased by the consideration and courtesy shown by Mr. Praeger.

Air Mail to St. Louis

The New York-Cleveland-Chicago air mail service will be extended to St. Louis by about the middle of September according to John A. Jordan, superintendent of the Western division of the mail service, upon his return from St. Louis today. The new leg of the service is approximately 400 miles long and will be covered by a single flight from Chicago.

A speed record for the 206-mile trip from Cleveland to Bellefonte, Penn., was established by Pilot J. H. Knight, who covered the distance in ninety-eight minutes, carrying 400 pounds of mail. The trip from Chicago to Bellefonte, 541 miles, was made in four hours and fifteen minutes. Pilot Lester F. Bishop made the trip to Cleveland from Chicago.

Airplane For Abyssinia

An American airplane and an automobile are among the souvenirs which will be taken home by Prince Dedjazmatch Nadao, head of the Abyssinian mission to President Wilson, it was announced, when that descendant of King Solomon and the Queen of Sheba returned last week with his retinue to sail for home after a week of sightseeing in various parts of the country.

Naval Aircraft Factory Building Seaplane Hangar

New Construction Designed to House Mammoth Navy Flying Craft of Which NC Type Is Recent Example

The new Naval Aircraft Factory hangar under construction at the Philadelphia Navy Yard was designed to house the mammoth seaplanes or flying boats with which the U. S. Navy is now experimenting, and of which the NC type is an example.

The hangar is 202 ft. wide facing the Delaware River and 150 ft. deep. A standard gauge railroad track enters the hangar from the rear so the hulls and wings arriving by rail can be unloaded inside.

The hangar is 66 feet from floor to eaves and the entire front of the hangar, 200 ft., can be opened for a height of 50 ft. by rolling back the four sliding doors. Each of these doors is 50 ft. square—as big as the side of a four story house—runs on a steel rail bedded in concrete, and is electrically operated.

Directly in front of the hangar is a concrete platform or apron 200 ft. square in the center of which is a large track scale, but without the railroad track, where the planes are weighed before launching. These scales will weigh the smaller seaplanes as well as the mammoth air cruisers now building. The surface of this apron is 10 ft. above the water level at low tide, and the rise of the tide at this point is about 5½ ft.

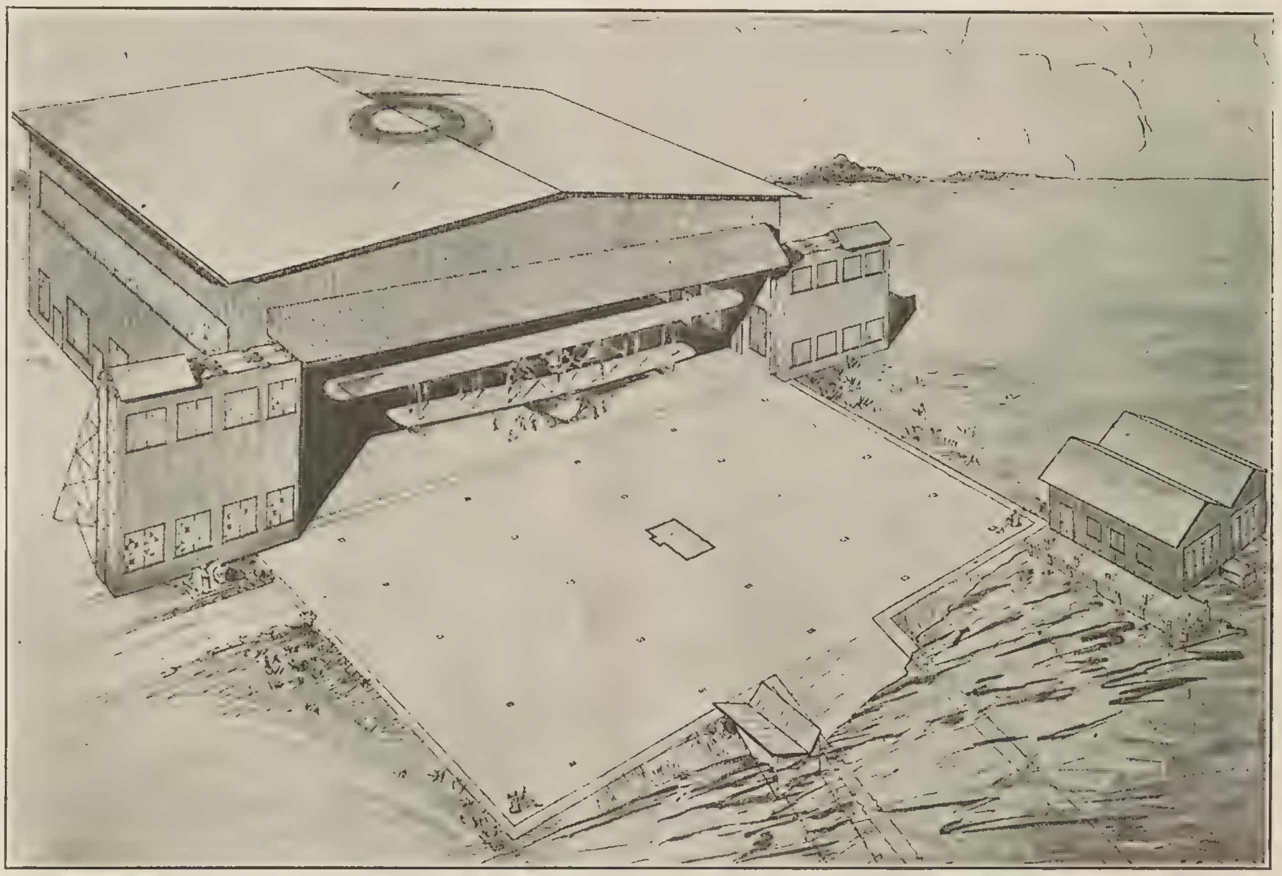

New Naval Aircraft Factory Seaplane Hangar. Note the 200 Ft. Span Without Pillars

Photo Naval Aircraft Factory.

From the water edge of the apron, and in line with the center of the hangar, a concrete ramp, 40 ft. wide, slopes gently into the water for a distance of 240 ft. Down this ramp the boats are launched and drawn up out of the water again by a caterpillar tractor.

To launch the very large flying boats a marine railway is provided. Two rails are spaced 14 ft. apart and slope away from the edge of the apron out into the water. The slope is the same as that of the ramp, one foot in 12. The launching car carrying the boat is operated up and down this railway by an electric winch.

If the wind is from an unfavorable quarter when launching a large flying boat, it is necessary to steady the plane by the outer ends of the lower wings. As the wing spread of different models varies considerably it was necessary to provide floating rafts which could be anchored parallel to the marine railway and at any desired distance from it. These rafts have the same slope as the marine railway and enable a group of sailors to steady each wing until the flying boat floats clear of the launching car.

Down the stream 350 ft. a pier extends out into the river a distance of 350 ft. To give further protection on the upstream side and to facilitate handling, a low wooden pier 180 ft. long has been provided.

As no seaplane station is complete without a fleet of fast motor boats, several are provided. These are stored in a boathouse 48 x 60 ft. It is located beside the pier and is built on wooden piles the same as the pier itself, the ramp, marine railway and the apron. The boathouse is provided with its own gasoline and oil storage system.

The station is protected against fire by a modern foaming chemical apparatus that will smother the hottest gasoline fire under a heavy blanket of carbonic acid gas.

Aviation gasoline is stored in two 10,000 gal. railroad tank car tanks, buried underground behind the hangar. Two 2 hp. electric rotary pumps distribute this gasoline about the hangar through underground pipe lines, to seven filling stations. Either pump draws gasoline from either or both tanks and delivers to each filling station. Commander F. G. Coburn provided all this equipment in duplicate so that a failure or break-down in any part of the system would not delay a flight. Oil is distributed in like manner from a 700 gal. underground storage.

Of the seven filling stations provided, four are located in the hangar, two on the apron in front of the hangar, and one on the pier 175 ft. out in the water. Gasoline, oil, and water for the radiators are available at each station. For example, a seaplane is to be fueled out in the water. Pressing a button at the end of the pier automatically starts the gasoline pump at the storage tanks 700 feet distant and gasoline is immediately available under 40 lb. pressure at the pier filling station. Ample length of gasoline hose with nozzle shut off is part of the equipment. After all the fuel tanks of the seaplane have been filled pressing another button stops the pump. A meter at the station has recorded the amount of gasoline delivered. Should the stopping button be neglected a red pilot light at the station shows that the pump is running idle.

The same careful consideration is given to every detail of the hangar equipment, and the result is a station that, when complete, will be a model of convenience. The power operated equipment will eliminate large hangar crews which have heretofore been necessary.

Although complete in every sense, the hangar is by no means extravagant, for the same careful economy that has characterized the operation of the Naval Aircraft Factory is evident in its new hangar. Nothing new was provided that will not quickly pay for itself in decreased operating cost. That this will be proved in actual practice is confidently expected.

AIRCRAFT JOURNAL

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Loughead F-1 Seaplane

The cover of this week's Aircraft Journal shows a Loughead seaplane Model F-1 in flight. This seaplane is manufactured by the Loughead Aircraft Manufacturing Co., at Santa Barbara, and accommodates two pilots and eight passengers.

For Landing Fields

Exhibition flights will hereafter not be made in cities where there are no adequate landing fields, as the result of an announcement made by Maj.-Gen. C. T. Menoher, Director of the Air Service. General Menoher reminds that study must be given to the limitations and special requirements of the airplanes and dirigible as well as to the special advantages of aerial navigation.

South American Record

The Argentine aviator, Antonio Merolla, set a new South American altitude record for seaplane with passenger by ascending 5,000 meters, about 16,500 feet, July 23.

Toronto-New York Prize

The award for the air race between Toronto and New York has been increased by the donor, John McE. Bowman. The race will be held during the week of Aug. 25.

Trans-Continental Flight Further Delayed

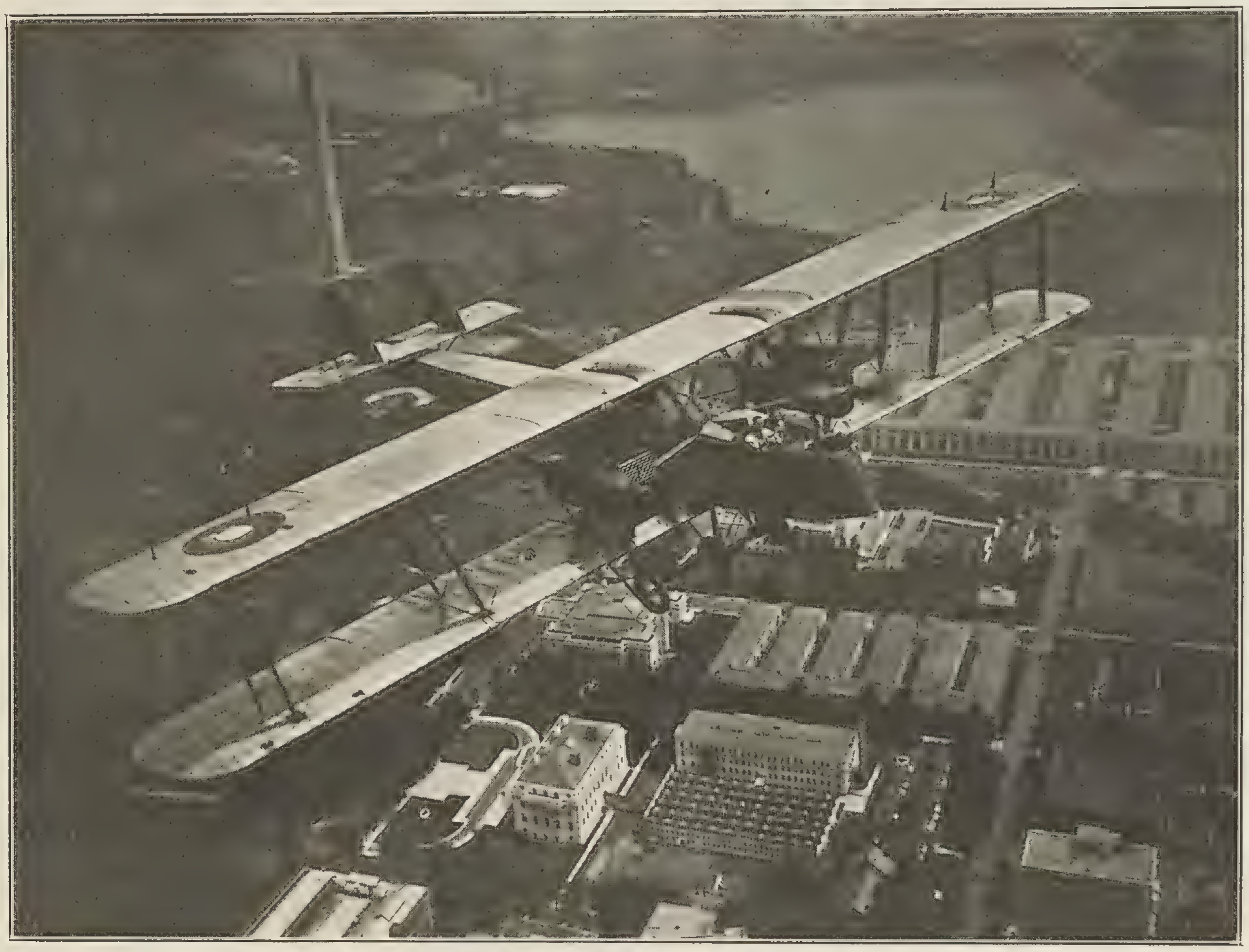
Captain Francis' Martin Bomber Wrecked in Hangar by Storm After Fast Flight from Dayton to Mineola

Another delay was caused in the trans-continental flight of an Army Martin bomber, piloted by Capt. Roy N. Francis, last Monday when a violent storm, with the characteristics of a tornado, struck Hazelhurst Field in its eccentric course and wrecked the Martin bomber housed in the large iron hangar at the north end of the field. A bolt of lightning hurled iron plates and girders on the plane, and the twisting wind, entering through the torn roof, completed the destruction.

Captain Francis had only a few days previously arrived from Dayton, ready for the first great hop from Mineola to North Platte, Neb., a distance of about 1500 miles.

Captain Francis' flight from Dayton to Mineola was made July 25 in six hours and 52 minutes, considerably better than 90 miles an hour for the 650-mile journey. The flight was made against a northeast wind for almost the entire distance. Inspection of the plane and testing of the engines was immediately begun.

Details of the preliminary route surveys made public by the Navy Department show that the Martin Bomber to be used carries 710 gallons of gasoline and consumes about 36 gallons an hour at a speed of 90 miles an hour. It is believed the plane will make from 1,600 to 1,700 miles without refueling.



Martin Bomber Over Washington
(C) Underwood & Underwood

It is probable that the stop will be made in the vicinity of North Platte, Neb., which is 1,502 miles by air route from New York.

Unless unusually strong cross-currents prevail, Captain Francis will be able to maintain his course between latitude 37 and 42 north. Winds which would blow him off his course would be offset by favorable winds from the east to be found at certain altitudes.

The route proposed over the Allegheny Mountains starts from Bellefonte, the highest peak being 2,250 feet, and the average height 1,700 feet. This average extends to Clarion, and then begins to slope down gradually toward Cleveland.

Across Nebraska the altitude runs as high as 4,849 feet. The Platte is crossed west of Waterloo, the line of flight being some twenty miles south of the railroad until Central City is reached, thence the route is to North Platte, 1,502 miles. Continuing westward, the line of the railroad is followed close to the Colorado boundary, and Wyoming crossed at Pine Bluffs. The land elevation is there above 5,000 feet, and the distance from New York 1,650 miles.

Passing Cheyenne (6,058 feet), the aviator will be close to Pole Mountain (10,000 feet), and cross the Laramie River at the city of that name (7,145 feet.) A safe flying altitude should be from 2,000 to 3,000 feet higher than the land elevation, and air currents moving around the mountains may call for a higher altitude to avoid the side drifts. Carter, Wyo., on the Muddy River, is 2,000 miles from New York, at an elevation of 6,507 feet.

Utah is entered at Castle Rock. Salt Lake is a little south of the direct route, but a good objective on account of the variable winds from off the Wasatch Mountain range. Crossing Great Salt Lake and continuing west, Nevada is entered at Shafter and the Thousand Springs Valley followed, the route passing north of the Ruby range and between the Elko and River ranges to Carlin and Winnemucca; thence to the Humboldt River Valley and Reno. An alternate route west to Ogden may be taken that will cross Lake Tahoe (6,225 feet), and California entered at Truckee.

An altitude of 11,000 feet is necessary to insure a safe crossing of the Sierra Nevadas.

"As the trans-continental flight is to be one upon which valuable data and photographs will be made, the weather conditions will be a considerable factor and will determine the exact time of starting after arrangements have been completed," says the War Department's statement.

Captain Francis' trip will be the longest nonstop flight made in this country.

The storm that wrecked the Martin bomber also smashed the giant Caproni triplane, which was frequently seen over New York, and a great Handley Page machine weighing eleven tons. These were three of the largest planes in the country. Two smaller machines were also wrecked.

Bombing in Mexico

Americans at El Paso, Texas, from Chihuahua, Mexico, have brought reports of the accidental bombing of Gen. Pablo Queroga's federal infantry by government airplanes scouting for Villa bands. The soldiers were marching overland from Jimenez to Parral, the Americans said, when they were sighted by the airplanes and bombs were dropped among the infantrymen.

No estimates of the casualties was known by the Americans.

Breaks Altitude Record

In a test flight, Roland Rohlfs, test pilot for the Curtiss Engineering Corp., Garden City, L. I., broke the American altitude record by reaching a ceiling of 31,100 ft. This is 2200 ft. better than record made last year by Major R. W. Schroeder of the U. S. Air Service in a Bristol with a Hispano-Suiza motor. Schroeder still holds the official world's record, although Casale, a Frenchman, in a Nieuport, is accredited with an unofficial record of 33,100 ft., made early this year.

Rohlfs's record was made in a Curtiss Wasp, a triplane designed and built by the Curtiss company for the United States Army. It is equipped with one of the new Curtiss 400-hp. motors. Early this year, in a test flight under the auspices of the government, it made a speed record of 160 m.p.h. and a climbing record of 16,000 ft. in ten minutes. Rohlfs expects to make his official test early next week, and, according to the performance Thursday, he anticipates no difficulty in setting a new world's record.

Rohlfs stated that the temperature at the highest point in his flight was 25 deg. below zero. In making the flight Rohlfs traveled more than 200 miles.

Airplane Linen Bids

Bids for 120,732 yards of airplane linen are invited by the Bureau of Aircraft Production, the New York district office of which is at 360 Madison avenue. All bids for the purchase of the goods must be submitted by 12 m., August 2.

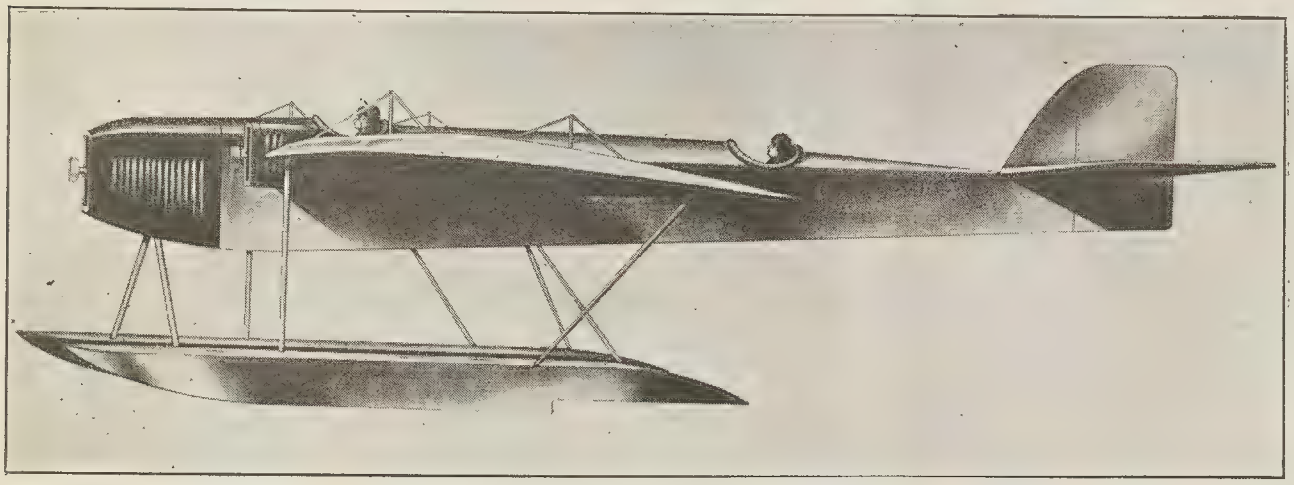
Long Seagull Flight

From New York to New Orleans and possibly to South America in a flying boat by way of the Hudson, St. Lawrence, Ohio and Mississippi rivers, with a jump by rail from Buffalo to Cincinnati, is planned by the Curtiss Aeroplane and Motor Corporation, to be started early in August by Majors W. E. Parker and G. Talbot Willcox, formerly members of the Royal Air force, in a Curtiss Seagull, a three passenger flying boat, equipped with a 150-horsepower motor and wireless telephone and telegraph. Reports of the progress of the flight will be made to the American Flying Club Radio service.

Major Willcox served with the Sixth Highland Light Infantry during the early part of the war, taking part in the Dardanelles campaign. He went to Egypt and joined the air force, and was sent to France as a member of the first night bombing squadron.

White Monoplane to Attempt Trans-Pacific Flight

Construction of Three-Engined Seaplane Rushed in Competition for $50,000 Prize Offered by T. H. Ince



Triple-Engined White Monoplane

The construction of a triple-engined monoplane is being rushed at the Los Angeles factory of the George D. White Co., in preparation for a trans-Pacific flight. The White monoplane is of the seaplane type having twin floats and is the largest monoplane in the world. Full cooperation is assured, the route is mapped and the flight is to be made within the coming months. A northern route, as shown on the accompanying map, has been chosen as more suitable at this time. The assistance of the Pacific Aero Club, the Aerial League of Canada, and that of the Governor of Alaska, the Hon. Thomas Riggs, Jr., who is preparing arrangements for the stop at Sitka, has already been offered. The route, according to Mr. Riggs, will have an average temperature of from 53 to 60 degrees, which is not severe despite the rather northern point.

From Los Angeles the first jump will be to San Francisco, a distance of 450 miles. From there to Victoria, B. C., a distance of 750 miles. From Victoria to Sitka, Alaska, is a jump of but 650 miles. From Sitka to Unalaska on the Aleutian Islands will be an overseas journey of 1200 miles. This jump completes practically half the journey over the ocean.

The next lap is from Unalaska to Petropavlovsk, Kamchatka. This is a 1500 mile flight and one of the longest to be made, as although some of it is within sight of the islands, the greatest part is across the Pacific Ocean. Technically, the trans-Pacific flight would end here, but the White monoplane plans another hop to Yokahama, Japan, another long flight but one of comparative ease. The final jump will be to Shanghai, the end of the historic 7000 mile trip.

Route Most Suitable

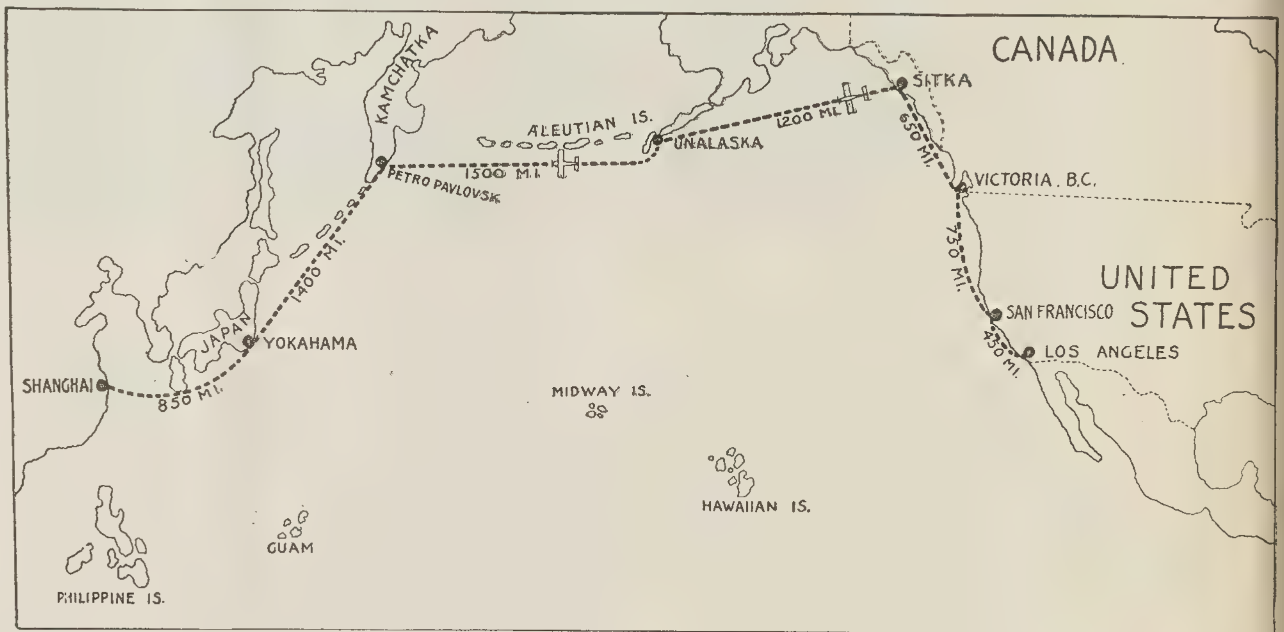
This route appears most suitabble at the present time. A route via Hawaii and the South Pacific Islands had been suggested but the White Company has decided that this would be impractical. Either stops would have to be made at the many small islands or a non-stop flight of 3000 miles would have been required. Although such a flight is probably not impossible, still one of that length has never been made, and it would be hazardous to attempt it over unknown waters.

Equally important to the route chosen is, of course, the type of airplane to be used in the attempt. The White Co. is using a monoplane, since they have specialized on monoplane construction for five years.

Mr. White himself was connected with the Glenn L. Martin Co. during their early years in Los Angeles, and it was during his connection with them that the famous Martin type "S" seaplane was developed, breaking all records at that time.

Dimensions of the Ship

The dimensions of the trans-Pacific White Monoplane are as follows: Spread of wings, 82 ft.; length over all, 39 ft.; height to top of fuselage, 9 ft.; weight empty, 3700 lb.; weight with crew and fuel for the Pacific flight, 7900 lb. The total horse-power is 660, which is generated by three Hispano-Suiza motors. Two 180 hp. motors are located one on each wing on each side of the central body. The third motor of 300 hp. is installed in the nose of the fuselage as in single-motored airplanes. The wings have a peculiar sweepback, raked tips and an angle of incidence of four degrees. The angles are so worked out that the monoplane has practically inherent and automatic lateral and longitudinal stability. All surfaces are balanced, making control simplified and untiring.



Route Planned for the White Monoplane's Trans-Pacific Flight

A unique motor arrangement is planned. Either the two 180's or the one 300 hp. engine will be used at one time, but all three are not to be used simultaneously. Three hundred horsepower will give the monoplane a speed of 110 miles an hour. By having approximately the same amount of power in reserve as is being used, the possibility of failure, it is claimed, is eliminated. At the start off, the two 180's will be used with the 300 hp. center motor in reserve. After running a certain number of hours the central motor will be switched on and the two smaller engines shut off. This method will be followed throughout the entire flight, which allows the motors to rest, and also allows a motor expert to make an inspection and any minor adjustments necessary.

Minor repairs can even be made in flight, though, of course, a crankshaft cannot be replaced or a broken cylinder repaired. However, new spark plugs can be installed, carburetor adjustments made, ignition troubles overcome or other minor requirements which under ordinary conditions mean motor failure and an interrupted flight.

The White trans-Pacific monoplane will probably not be equipped with wireless, as the White Co. considers wireless a useless weight, unless important improvements are made within the next few months.

Original Construction

The White monoplane is of highly interesting construction. The White truss system is used in the construction of the wings. No wires are used in the construction whatever, and no cables are needed for the controls or other parts.

The fuselage is constructed as a compact unit; there are no wires and turnbuckles as in former aircraft. The fuselage is built of Haskelite, a strong veneer built up of Oregon spruce and African mahogany, which is cemented together under hydraulic pressure. This gives enormous strength and is water tight and gives perfect alignment.

The wings are built on the White truss principle and employ the White truss system of rigid construction. There are no wires to loosen and snap. The wings are built solid and braced with solid struts so that the entire plane is one rigid mass, each part as solid as the other. This type of wing bracing has been thoroughly tested during the past two years on single-seater White monoplanes, and is now also being used on planes other than White design, as important features are quickly used by all manufacturers.

The rigid fuselage will have ample cockpits for the pilot and navigator. A locker is provided where each when off duty can stretch himself and if desired have a nap, although on the short hops and with two pilots planned there is little to tire one. Hot coffee and lunches will, however, be very suitable over the long stretches of water when there will be nothing for the pilots to do but hold the giant plane on her course and follow instructions of the navigator.

Pontoons, or floats, will take the place of wheels used on land machines. These serve two purposes, first to assure flotation indefinitely in case of running out of fuel or other incident causing alighting on the water, and also because the country being somewhat unknown, it is not certain that landing fields could be found, but it is certain that there is lots of water. The pontoons, two in num-

(*Continued on page 16*)

News of the Army and Navy Air Services

Hartz Starts Flight

The Martin Bomber commanded by Lieut.-Col. R. S. Hartz and carrying a crew of five has completed the first two legs of the long "Round-the-Country" flight—7,805 miles in all—planned by the Air Service.

Colonel Hartz left Washington at 10 a. m. July 24, landing at Mineola at 12.47. Haze prevented observation during the first leg of the flight and the course was held by compass. While flying over Baltimore, it was found that the oil and water tanks were leaking. These were repaired by Master Electrician Jeremiah Tobias while the plane was moving 90 miles an hour, 5,000 feet over the city, from a position on the wires beneath one of the wings.

Colonel Hartz started from Mineola for Augusta, Me., at 8:25 the next morning, making a perfect landing on the State Muster grounds at 1.05 p. m., a flight of four hours and 40 minutes. The trip was uneventful, although quite cold for the aviators.

The bomber started on its third leg of 660 miles, from Augusta to Cleveland, O., but after encountering bad storms in the mountainous parts of New Hampshire and Vermont was forced to land near Ausable Forks, N. Y., near Lake Placid. Colonel Hartz reported that after passing through heavy storms the plane was lost in the fog for four hours, its compass having failed to work. In coming down under these conditions, apparently due to miscalculation or to a rough spot, the landing gear coupled and the big plane bumped its nose on the ground hard enough to break it. None of the five men aboard was injured.

This was the cause of a delay of several days for replacing the damaged parts of the running gear and the broken nose of the plane. The flight will be resumed as soon as the repairs are completed.

New Hangars Huge

The dirigible hangar which the Navy will erect at Lakehurst, N. J., as the first of the permanent housing sheds for its proposed giant dirigibles, will be 800 ft. long, 265 ft. wide and 174 ft. high. These are inside dimensions.

The space actually occupied will be 920 ft. long and 352 ft. wide, and the structure will be more than 200 ft. The doors, of which there will be four, two at each end, are 129 ft. wide and 174 ft. high.

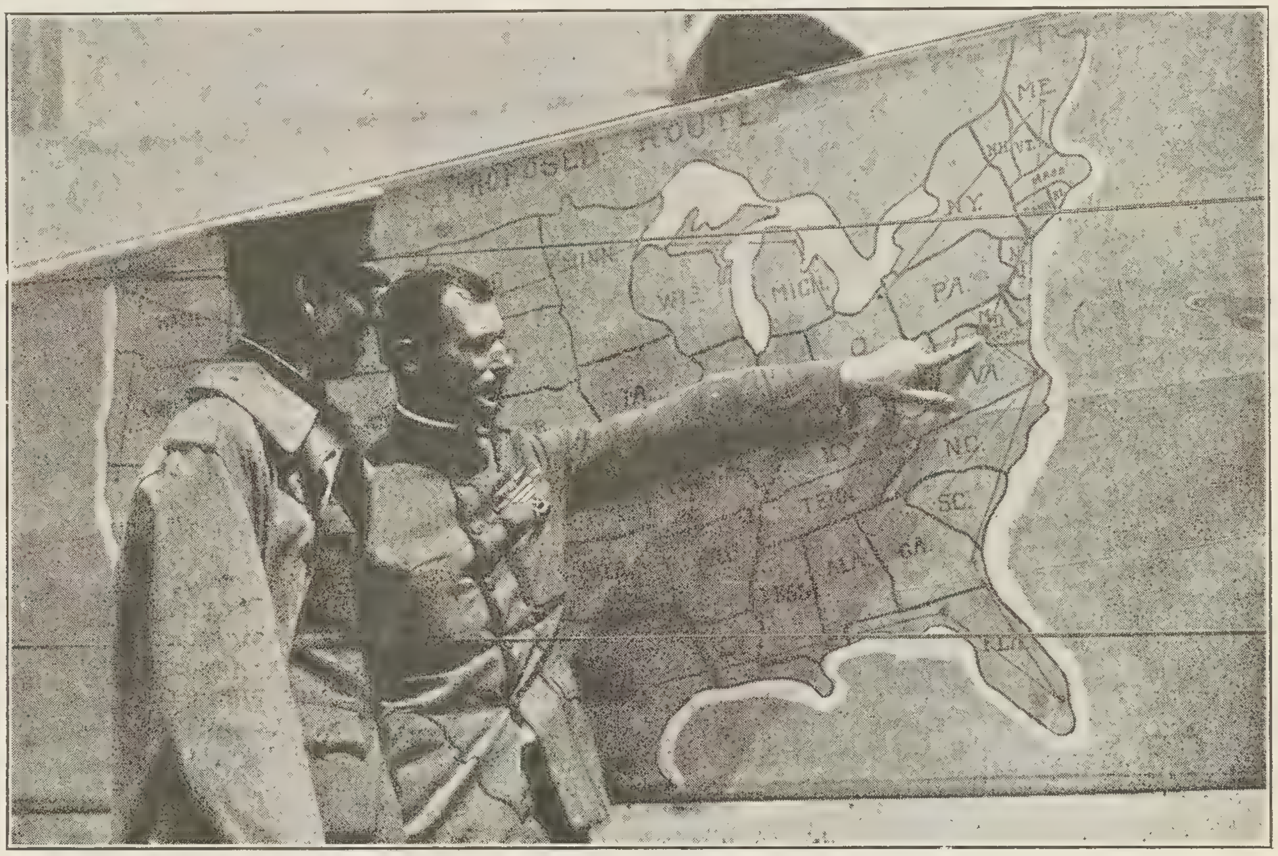
The steel tonnage will exceed 6000 tons, and the cubic contents of the building will be 50,000,000 ft. It will be covered with colored, corrugated asbestos, which will make it fireproof. A series of windows and skylights on all sides will afford ample light, while there will be numerous staircases and two huge elevators leading to the roof. In the spaces between the great trusses will be placed numerous shops for the use of the aviators.

Three railroad tracks will run the length of the hangar. The building will hold one 10,000,000 cu. ft. ship and two smaller ones at the side, or two 5,000,000 cu. ft. ships side by side.

Colonel Chandler Honored

General Collardet, Military Attache French Embassy, announces that the Government of the French Republic has conferred upon Col. C. De F. Chandler, Chief Balloon and Airship Division, Air Service, the rank of Officer of the Legion of Honor, in recognition of the meritorious services rendered by Colonel Chandler as Chief of the American balloon service in France.

The medal was presented to Colonel Chandler at the French Embassy.



Colonel Hartz Explaining Map Painted on Fuselage of Martin Bomber
Photo International Film Service.

Balloon School Tract

Officers representing the Federal Balloon Commission are inspecting and mapping out the land in the vicinity of Lewistown, west of Camp Dix, N. J., which will be required for the proposed balloon school—the largest in the United States.

Although Congress recently turned down the appropriations for the proposed school near Camp Dix, the issue has been revived and the planned establishment will be more than twice the size of that at first contemplated. The school will require several hundred acres for landing fields, hangars, shops, barracks and gas generators. This may be extended later to include a great aviation base in order that there may be closer cooperation between the two branches of the Air Service.

Army men say that the recent voyage of the R-34 has done more than all the efforts of American airmen to center public opinion in the United States on the importance of the rapid development of the American dirigible.

From what can be learned unofficially last week regarding the commission's plans, the proposed station is to be made the most important in the country. Not only will it be a school in which all branches of flying lighter than air vessels will be taught and the great dirigibles constructed, but it will be the chief air base in military defence plans for the Atlantic seaboard.

The Navy Department is said to be planning to construct the first great American dirigible at Camp Kendrick, Lakehurst, N. J., which will be part of the proposed camp. The new airship will be larger and have a greater range than the British R-34.

On the Pocahontas

The transport Pocahontas, due in New York August 1, which left Brest, July 22, had the following Air Service units on board: 1st, 24th, 186th and 258th Aero Squadrons; 24th and 44th Balloon Companies, and 5th, 16th, 101st and 104th Photo Sections.

Army Flying Hours

United States Army pilots flew 55,671,120 miles in the eighteen and a half months between January 1, 1918, and July 17, 1919, according to an announcement made by the Director of the Air Service.

The figure is based upon an estimate of sixty miles for each hour of flying. This is a very low estimate, since most of the planes used could and did fly at rates between seventy-five and 120 miles an hour without counting the wind velocity, which at times reduced or raised their speed. The number of hours spent in the air by the Army pilots was 927,852, about 106 years. It is hard to give an idea of what 55,671,120 miles means. It is equivalent to 2,227 circumnavigations of the globe at the equator.

Kelly Field No. 2, at San Antonio, Tex., led all the rest in the matter of hours flown. The pilots of this field remained in the air 167,982 hours, more than nineteen years. Ellington Field, at Houston, Tex., was a moderately good second with 95,293 hours. The reason why Texas is the banner State for flying was that its fine climate and long stretches of flat lands, making perfect landing fields, caused it to be chosen for much of the training of new fliers. Rockwell Field, at San Diego, Cal., was third on the list, with 61,659 hours flown.

Cross Country Flying

Cross-country flying by the Air Service, U. S. A., for the week ending July 19, 1919, was 51,918 miles. This does not include flying at fields in giving instructions to enlisted men.

Flights for R. M. A.'s

The commanding officer at any Air Service station where flying is authorized may at his discretion permit qualified Reserve Military Aviators to take such practice flights as the commanding officer may deem advisable, according to an official announcement from Washington. Cross-country flights are not permitted under this privilege.

L. D. GARDNER. . .*President and Editor*
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Formerly Air Service Journal

Air Service Appropriations

THE great reduction in the Air Service of the Army which the War Department has announced as necessary due to the smallness of the appropriation voted by Congress, has a deeper significance than appears on the surface. Superficially, Congress appears to have knived the Air Service appropriations horizontally and allowed just enough money for a skeleton to be maintained. The War Department seems to have replied that the Air Service will be wiped out and the public must judge the real parties responsible.

But beneath all this political " passing-the-buck " there is a truth that should not be overlooked. The Secretary of the Navy came out whole heartedly for his Air Service and personally told the Congressional committees how essential aeronautical development was to the Navy. The result is that the Navy probably received more than it really expected in $25,000,000. It has at least a nucleus around which it can build during the coming year. When the War Department is looked into, no such unity of opinion appears. Just what the Secretary of War desired for the Air Service was so deeply clouded in the plans of the General Staff that it rested on General Menoher and his staff to make the fight for appropriations for an adequate Air Service. That these figures were cut from $83,000,000 to $25,000,000 is not due to any failure on their part to present their case strongly, but the House undoubtedly lacks confidence in those who seem to be responsible " higher up " for the affairs of the Air Service.

Until the recommendations from the Air Service are heeded; until those who make the plans and carry them out know the Air Service and can speak for it; not until then will Congress have faith enough in an Air Service to give it a reasonable appropriation. Till then let the public inquire what Congress would have done for an Independent Air Force freed from the tentacles of red tapism and traditional dislike of the older lines of the Army and Navy.

Federal Air Legislation

THE recent accidents occurring over populous areas has brought forth the usual discussion of local legislation and regulation of aircraft. Such rules have been argued for a long time and it is hoped that the Crowell Committee will have such rules of the air ready for Congressional approval that it will prevent the passage of petty local measures which may tend to prevent the widest aeronautic development in the future.

By all means, protect the innocent person under all craft, make the aircraft responsible for property damage, and have a most careful system of licensing, but be certain that the rules are national and their application is countrywide.

Fire Protection on Planes

IT is gratifying to note a continual decrease in the percentage of accidents in the airplane. There is no doubt that the safety of airplane travel will in a comparatively short time equal that of the automobile. Progress is not due to any marvelous invention, but rather to many improvements from many points of view.

Structural failure in the air is almost a thing of the past, because careful stress analysis and sand testing have given the aeronautical engineer a perfectly adequate knowledge of the subject. Pilots may be no more skilful, and quite as daring as in the early days, but they have a better knowledge of the plane and its limitations and a more assured technique. Landing fields have increased in number and improved in quality. Stability in flight is secured on almost all modern planes. The next most profitable angle from which to attack the general problem of safety is that of fire protection.

There is no reason why fire hazard should not be reduced to the very minimum. Smoke-stacks and screens on the carburetor should be employed invariably. A number of fire-proof dopes have met with pronounced success and more perseverance in this direction will be well worthy of effort.

Fire extinguishing gases can be so directed as to fill the entire engine section, at the pressing of a switch. It would not be surprising if perfect safety in this direction were possible even with the means already at our command.

The Commercial Rating of Airplanes

IN the military rating of airplanes, speed and climb, vision, gun power and manoeuvreability were the determining factors. In commercial work quite different factors have to be considered. Vision and manoeuvreability remain, speed is still essential, safety is paramount, but cost per ton-mile now has to be considered.

A great many factors enter into the computation of such a figure, overhead, durability of plane and engine, and depreciation, personnel required to operate planes.

When, however, a rough basis of comparison has to be established between two planes, from the point of view of their commercial value, a useful expression has been suggested:— (Useful load × distance) ÷ (horsepower × time).

On examination this formula gives an idea of fuel consumed for a given useful load × distance. And a fair idea of the economy of a plane.

It is probable that slow machines would show up far better on this rating than speedier ones. It would be interesting to see similar formulae tried out and discussed.

Trans-Atlantic Flight by Airplane

NOW that the Atlantic has been crossed twice by plane and the first burst of enthusiasm has subsided, the question arises whether the two flights are merely stunts, or whether they are paving the way for commercial utilization.

Crossing the Atlantic, even without a stop and without a convoy of destroyers, does not signify that flights by this method would pay.

In the twin-engined Vickers-Vimy-Rolls there were indeed 10 hours gasoline still available at the end of the journey, but otherwise the ship was stripped bare. Roughly speaking when a machine of this type is designed, 50-55% is used up in the bare structure of the plane and the power plant, leaving 45% of the gross weight for passengers, fuel and useful load. In a distance long flight, such as the Atlantic crossing, the airplane uses up 25-30% of its gross load in full, leaving little for passengers and useful load.

There is, therefore, a good deal of improvement to be carried out, before an Atlantic service of a profitable character can be established.

Notes on Technical Aeronautics

Interesting Photographs of German Machines

A number of interesting photographs of German machines have recently come to the editor of Aircraft Journal from Mr. Erik Hildesheim, of Copenhagen, to whom go the best thanks of constructors for timely information.

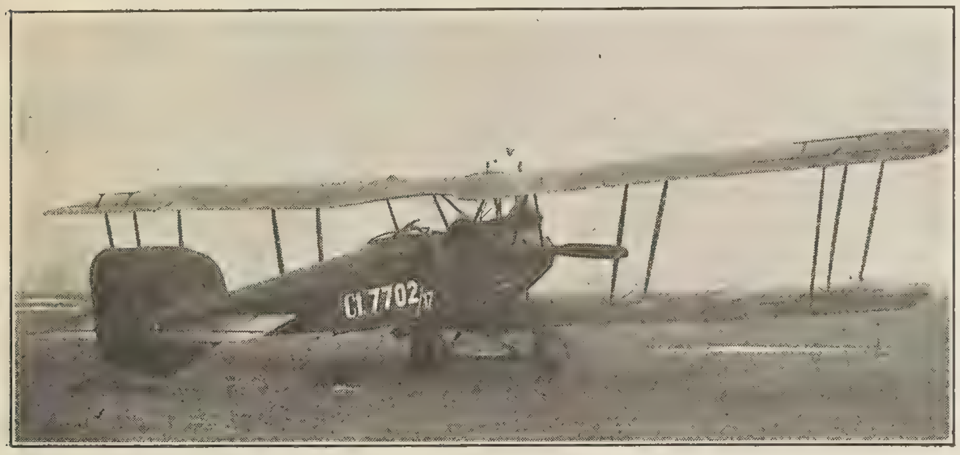

Fig. 1. Sablating Two-Seater Land Machine

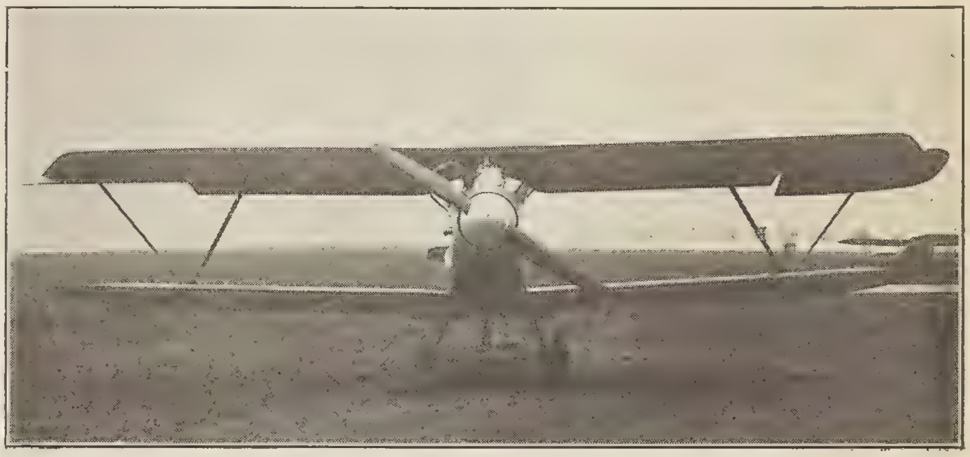

Fig. 2. The Hanoveraner C. L. IV

Sablating Two-Seater Airplane

The Sablating two-seater land machine, shown in Fig. 1, is used for night flying. The motor is a 180 hp. Argus, and the machine is noted for the particularly quick response to the controls. The ailerons are provided with a peculiar small balancing surface carried above the plane.

The Hanoveraner C. L. IV

The Hanoveraner C. L. IV, front view shown in Fig. 2 and side view in Fig. 4, is one of the latest of German machines, powered by a 260 hp. Maybach motor. This machine has a peculiar trussing, the struts not being in the same plane. The fuselage is evidently of the veneer type. A curious biplane tail is employed, and there is evidently a rigid aileron control. The elevator and aileron surfaces in this machine are balanced.

The Sablating Triplane

The Sablating triplane is illustrated in Fig. 3. This plane carries a 150 hp. Benz engine and is a single seater triplane scout. The triplane wing structure is reminiscent of American practice. The floats are of very simple construction. The span of all three planes is 3 m. 25 cm. and the total area is 28.38 sq.m.

The Sablating Seaplane

The Sablating biplane which also carries a 150 hp. Benz engine is illustrated in Fig. 5. This machine is used principally as a naval training plane. Streamline wire is employed, and the overhang is supported by two struts meeting at a point on the lower front spar, as shown in the accompanying photograph. The strut bracing of the stabilizer is worthy of note.

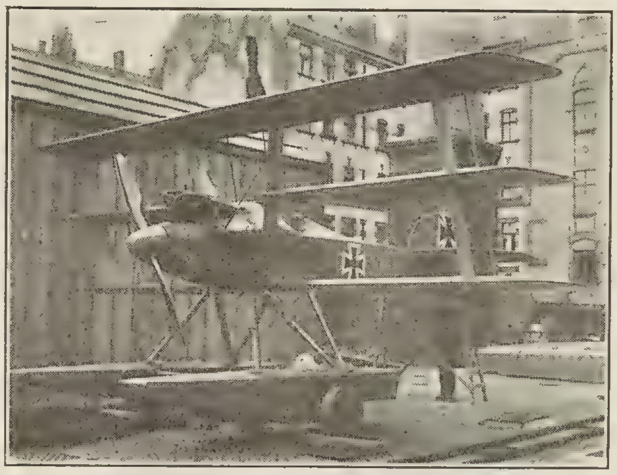

Fig. 3. Sablating Triplane

Wind Tunnel Tests

Wind tunnel tests on a model fuselage show the following qualitative results:

(1) *At any given plane* speed the total resistance of a fuselage with a flat nose radiator is increased by increasing the air flow through the radiator, either by opening exit vents for the air or by decreasing the resistance of the radiator to passage of air. This shows that a nose radiator—in contradistinction to a free air radiator—should be of compact construction with high heat transfer for low air flows through the core, therefore requiring a core of high resistance.

(2) *With varying plane speeds* the relative efficiencies of free air and nose radiators do not change.

(3) With all three widely differing types of core tried, the combined resistance of the fuselage and a free air radiator of given cooling capacity, was from 10 or 50 per cent less than that of the fuselage with a nose radiator of the same core construction and equivalent cooling capacity.

(4) From other experiments performed at the Bureau of Standards it is clear that there is more chance for improvement in types of core for free air positions than in types of cores for the nose position.

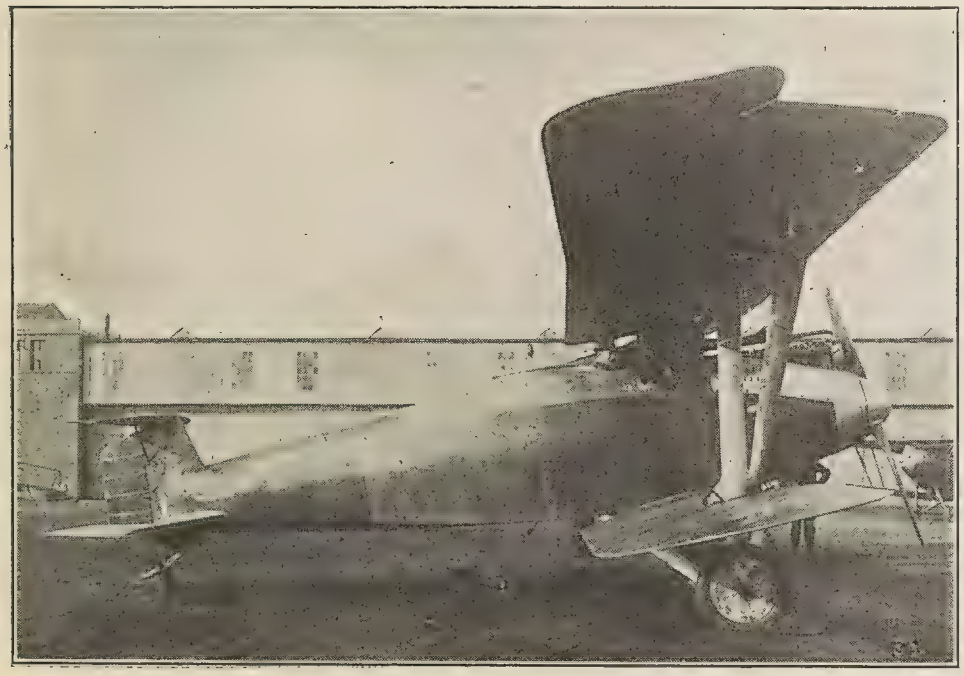

Fig. 4. Side View Hanoveraner C. L. IV

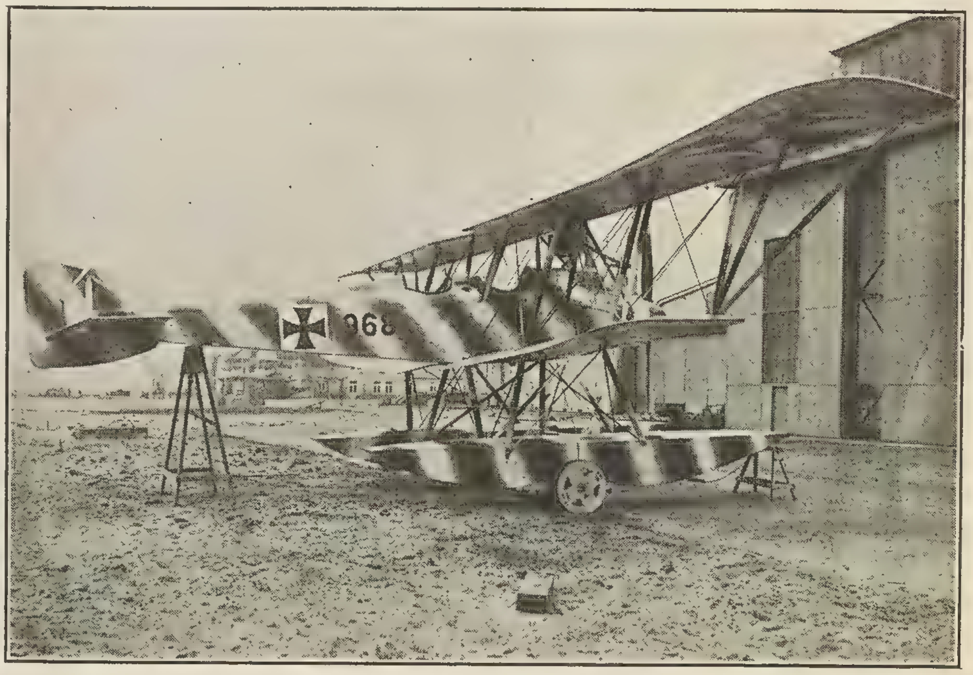

Fig. 5. The Sablating Training Seaplane

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Atlantic City-New York

Record time for a night flight through a thunderstorm marked the opening of the Atlantic City-New York regular daily airplane passenger service July 26. Robert W. Hewitt, one of the three pilots, all with war service records, who established the Travelers' Company, which will conduct the air transportation line between New York and the resort, piloted the Aeromarine flying boat, which made the return journey in 78 minutes, despite two forced landings for minor engine adjustments. The first passengers were Mrs. John Hoagland, of New York, and Miss Ethel Hodges, of Dallas, Texas.

First Atlantic City Passengers
Photo International Film Service.

The trip was made at an average speed of 80 miles an hour and the plotted route was followed without difficulty in the darkness because of the many illuminated landmarks along the way. The running lights were switched on when the lower bay was reached, but no landing flares had been provided at the anchorage and the flying boat was brought to rest in almost total darkness.

Regular daily service between New York and Atlantic City is contemplated by the company, with probably either two or three daily trips each way, at least during the summer season. The charge is to be $100 per passenger.

Flying to Scandinavia

Two British flying boats, each with two 250 hp. Rolls-Royce Eagle VIII engines, will soon leave Folkstowe for a nine days' trip to Norway, Sweden and Denmark.

Each flying boat will carry a crew of five, including a wireless operator.

The extended coast line of the Scandinavian countries offers peculiar facilities for flying boat traffic on commercial lines.

New York Aeronautics

Col. Archie Miller, commander of a squadron of eight army airplanes which flew to Albany, N. Y., July 24, presented to Governor Smith proposals for a definite program for the development of aviation under the auspices of the State. The recommendations are made at the request of the War Department, and are along the lines laid down by the Government to insure a country-wide development of the airplane industry. The proposals included:

The establishment of a State Commission of Aviation; legislation providing for landing fields; designation of the State constabulary to patrol the landing fields; the enactment of laws prohibiting trespassing on landing fields, to insure the safety of aviators and their passengers; the registration of all machines other than Government owned; State assistance in developing air mail routes; authorization for the creation of an air branch of the State militia and the establishment of fields, and the enrollment of former officers and enlisted men in the Army or Navy aviation section into a volunteer force, to aid in intelligent organization and development of flying fields and aerial routes.

The planes made the journey from Mineola in one hour and ten minutes, establishing a new record.

For College Instruction

The Air Service has an accumulation of miscellaneous airplane motors and unserviceable airplanes, which were used for instruction purposes at the various training camps and schools. It has been decided to offer these motors and airplanes to all colleges and schools desiring to teach aeronautical engineering, and prices have been fixed commensurate with their value for this purpose. These motors are unserviceable for flying but can be used for instruction purposes. The movable parts are all present. The airplanes are without motors but the controls are in position so that the action of the control surfaces can be demonstrated. This offer does not include instruments or propellers. These planes and motors are located at various storage depots in the United States and upon receipt of order, shipment will be made from nearest location. All prices are quoted f. o. b. location, and certified check, payable to the Treasurer of the United States, must accompany the order in each and every case.

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Liberty 12	250.00
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AIRPLANES

Unserviceable Airplanes without motors or instruments	250.00

Glenn Martin-R.
Standard J-1.
DeHaviland.
Thomas Morse Scout.
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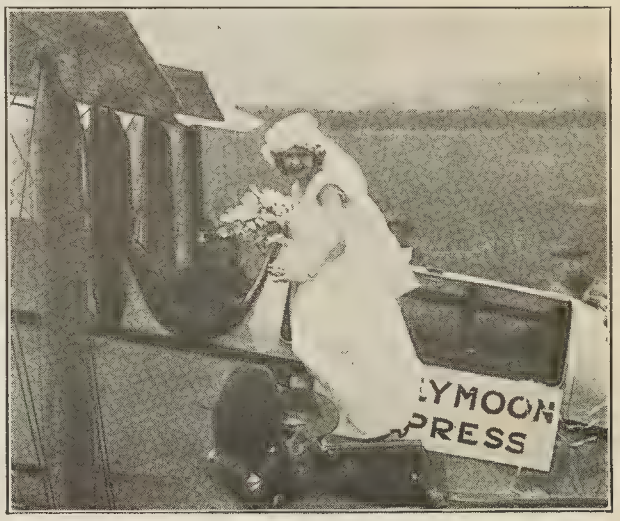
Wedding in the Clouds

A wedding in the air was the feature of the second half of the New York Police Games at Sheepshead Bay Speedway, July 26.

The bride was Miss Emily Schaeffer, of Sea Gate, and the groom Lieut. George Burgess, of the Air Service. The Reverend Alexander Wonters performed the ceremony.

Probably never in all history has there been just such a wedding. Not only did the bride and bridegroom ascend in one airplane driven by the bridegroom, but the clergyman ascended in another. And as if being married 2,000 feet above the earth were not enough, the couple entered into their alliance by means of the radio telephone. While the great throng sat hushed and immobile in the stands the knot was tied, and by means of megaphones attached to one of the radio telephone receivers and pointed at the spectators from various places, every syllable of the service was audible to all.



Bride in the Honeymoon Express
Photo International Film Service.

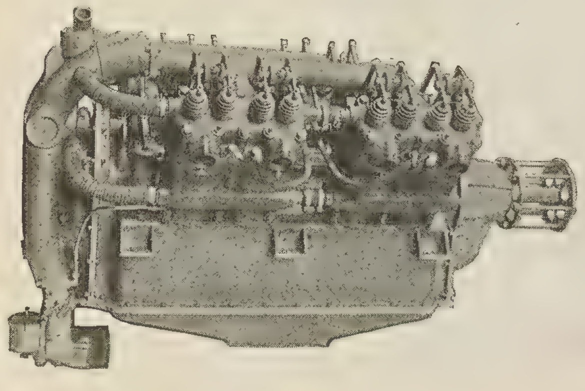
Even Governor Smith and Mayor Hylan were permitted to participate, the Governor congratulating the couple while the Mayor presented the bride with a huge bouquet.

To Surrender Zeppelins

Germany, according to report, must give up what remains of her fleet of Zeppelins, including the Z-72, the largest airship in the world, which Count Zeppelin's nephew, Baron von Germingen, wanted to fly to America and return. The Z-72 was completed quite a while ago.

It is expected the Allied commission which is to take over the Zeppelins will arive in Berlin soon and that the airships will be divided among the Allies. It has not been intimated whether the United States is to get one. There are ten, and two, the Z-71 and the Z-72, are the latest built, having fifty tons capacity. The others are of the R-34 type.

Germany's airship builders gloomily assert that the fruits of their work, experience and inventions will now be reaped by other countries.



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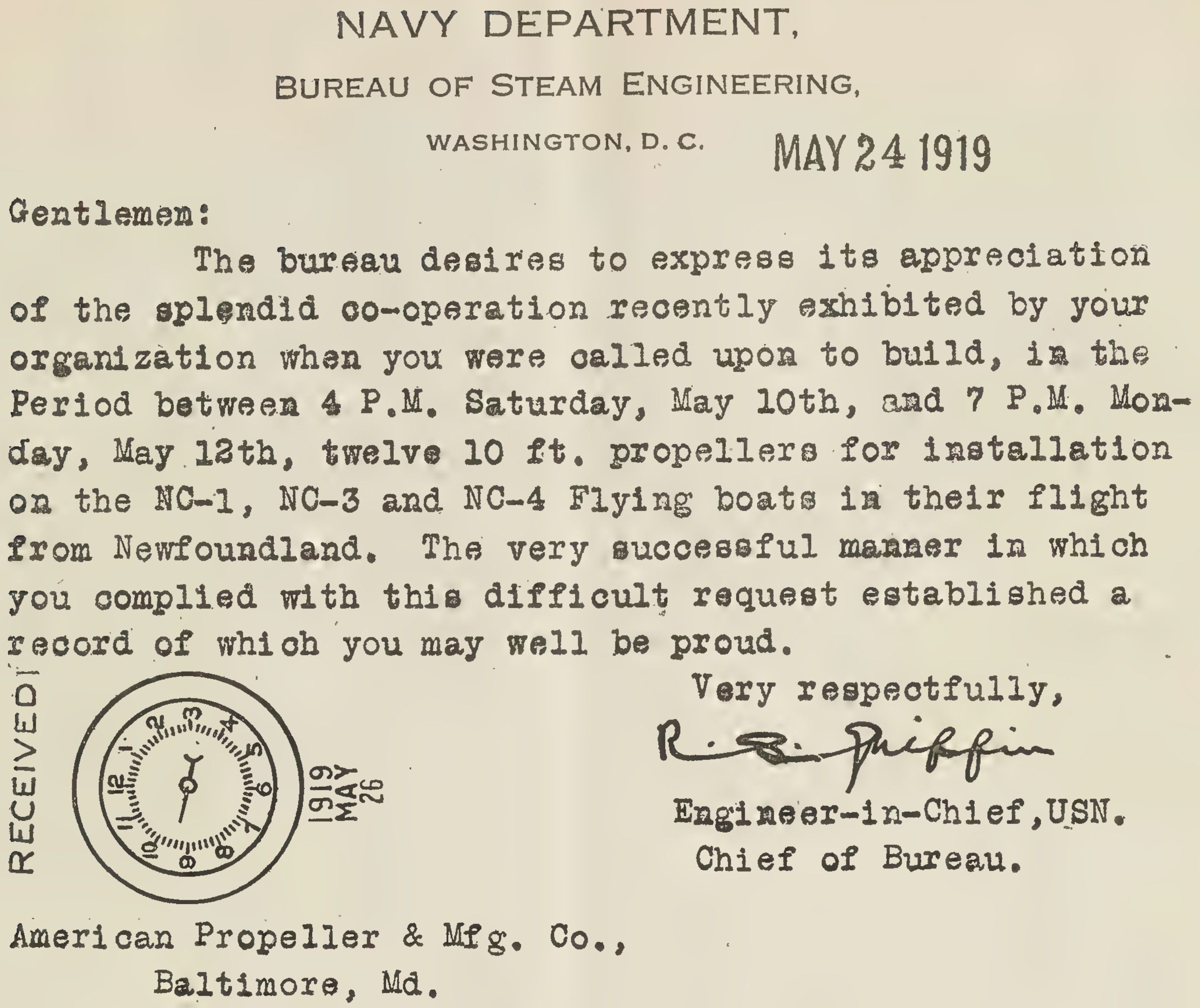

NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
WASHINGTON, D. C. MAY 24 1919

Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

Very respectfully,

R. S. Griffin

Engineer-in-Chief, USN.
Chief of Bureau.

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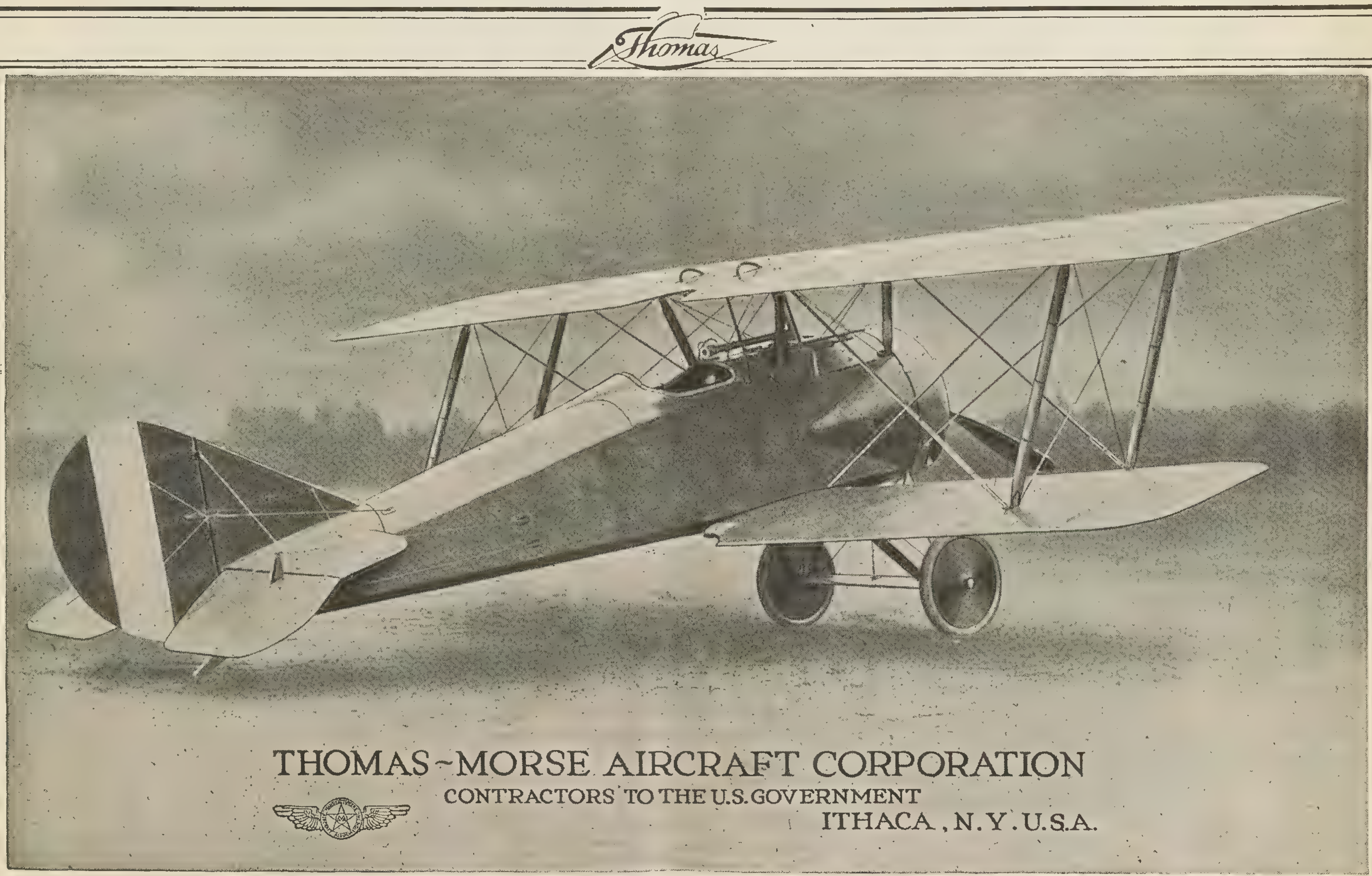
Baltimore, Md.



Thomas

THOMAS-MORSE AIRCRAFT CORPORATION
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Progress in Philadelphia

The Philadelphia Aero-Service Corp., with offices at 1209 Arch Street, Philadelphia, has commenced commercial aerial transportation service in Philadelphia.

Their aerodrome is conveniently situated in the suburbs of Philadelphia and consists of a level field of four hundred acres devoted exclusively to aeronautics, on which hangars have been erected and an aerial marker laid down to guide visiting airmen. An aerial map showing the air routes to and from various cities and the airfield has been published and copies will be furnished upon application to the offices of the corporation. The field has been adopted as the official flying field of the Aero Club of Pennsylvania, and owing to its splendid location it bids well to be the principal airport of Philadelphia.

Four planes have been purchased and a flying school started with the first class now ready to qualify for pilots' licenses. Lieut. Paul F. Houser, a retired military aviator, is the director of flights.

The aggressive manner in which the Philadelphia Aero Service Corporation has entered into the flying business indicates a healthy development of aerial commerce for Philadelphia, especially as plans are under way for an extension of their service to other cities as soon as larger aircrafts can be secured.

Seaboard Terminus

Vickers, Ltd., of London, is investigating the practicability of utilizing Atlantic City as the American seaboard terminus of a series of radiating lines for the institution of trans-Atlantic air tourists.

Vickers' announcement comes as the answer to a communication from the Atlantic City Chamber of Commerce a month ago, writing to the London headquarters of the Vickers, Ltd., asking that serious consideration be given to Atlantic City's special fitness as a coast air port, because of the magnitude of the field and its nearness to the sea.

Balloon Headquarters

Worcester has been chosen as the central headquarters of the Eastern department of balloon aviation at a meeting held last week.

Among those present were J. Walter Flagg, balloon pilot, and vice president of the New England Aero Club; N. H. Arnold, balloon pilot and instructor for an Army balloon school, who made several long distance flights years ago; Lieut. Joseph L. Batt, instructor at the Fort Omaha Balloon School during the war, and in charge of the balloon house; Theodore E. Hedlund, aviator and president of the Massachusetts Aero Club of Service Aviators, and Ensign Lester P. Dodge.

The airmen voted to procure several balloons and it is hoped to begin flights Sept. 1.

America's Opportunity

Trans-Atlantic air commerce, as a success economically, was predicted by Leon Cammen, engineer, in an address before the Aeronautical Society of America last week.

"The commercial possibilities of aviation are becoming clearer every day and the only question is, who is going to do the work?" Mr. Cammen said: "They are keeping their eyes wide open in England, and they remember that her speed in developing the large steamship restored British supremacy on the high seas when it was tottering. The United States has everything necessary to take the leadership."

X-Raying Airplane Wood

Airplane manufacturers in Great Britain are said to be submitting wood used in construction to X-ray tests. In one instance the radiograph of a fine silver spruce plank showed certain light and dark spots. When the plank was split it was found to be honeycombed by beetle borings.

British Parachute Trials

Major T. Ord Lees, A. F. C., who during the war was in charge of the development of parachutes for the British Air Force, has arrived in Washington with several assistants for the purpose of demonstrating the latest British parachutes to the American Government.

With Major Lees is Lieut. R. A. Caldwell, D. F. C., who jumps from airplanes to demonstrate the adaptability of the parachute. The interesting feature of the party is the presence of Miss Sylvia Boyden, a young lady of twenty, who also jumps from an airplane. According to Major Lees, the jumping of this young lady has a wonderful effect on the public in that when they see a lady land safely they have more confidence in parachutes than when a man descends. Miss Boyden is accompanied by Mrs. A. M. Thomas as chaperone.

It was decided that for the purpose of carrying on these demonstrations best, the detachment will be sent to McCook Field, Dayton, Ohio, in order that the Engineering Section will be able to take advantage of the work. It may be that after the tests are finished at Dayton, the detachment will return to Washington to give demonstrations at Bolling Field.

Gen. L. E. O. Charlton, the British Air Attache in the United States, is particularly interested in parachute development and is introducing Major Lees to the authorities in this country.

Take Over Airport

The Atlantic City airport, the first city flying field in the United States, has been taken over by the Curtiss Aeroplane and Motor Corp. The field covers the entire section of Atlantic City known as Chelsea Heights, and is 3,400 feet square. The value of the land is estimated at over half a million dollars.

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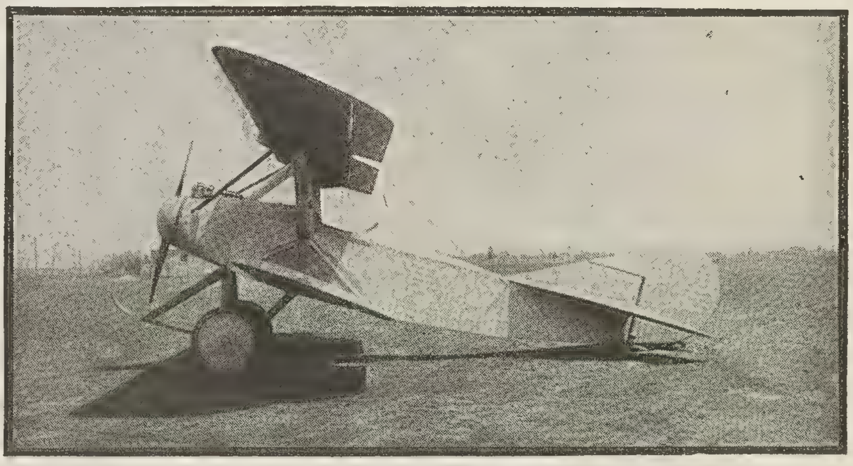

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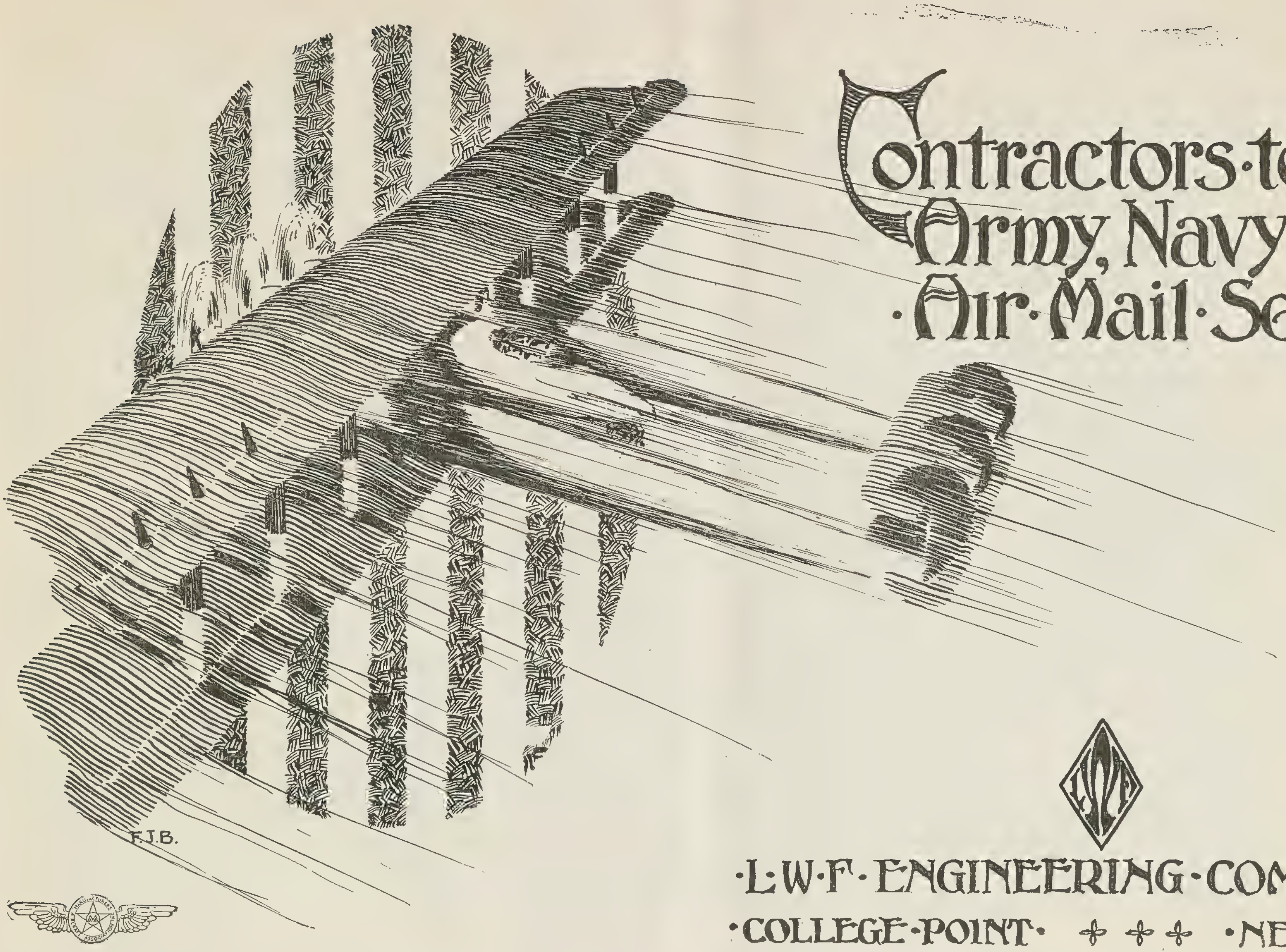

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Transcontinental Flight

In the interest of recruiting and for the purpose of charting, laying out an aerial mail route and collecting data as to municipal and emergency landing fields, a special transcontinental flight will leave Hazelhurst Field as soon as possible, having as its destination Seattle, Washington.

The tentative route will be across the states of New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, Minnesota, North Dakota, Montana and Idaho. Stops will be made at Philadelphia, Pittsburg, Columbus, Indianapolis, Chicago, Milwaukee, St. Paul, Minneapolis, Fargo, Bismarck, and other points en route. A distance of some 3200 miles will be covered.

The aircraft used will consist of four Curtiss JN-4H planes, and Type R observation balloon. The feature of the trip will be the observation balloon demonstration. This will be transported on trucks and inflated at several of the places where stops are made. The observation balloon will be the type R used on the front.

The motor transport equipment will consist of complete machine shop, with all the repairing machinery necessary carried on trucks and lorries.

Special attention will be given to photography that when the trip is finished no data will be lacking for the laying out of a perfect aerial lane from New York to Seattle.

The personnel of the party has not yet been decided, but it will consist of sixteen officers and thirty-six enlisted men.

Eighteen to twenty weeks' time will be devoted to the work, and the results determine the route of the return trip.

Iceland Air Service

A company has been formed in Iceland to establish regular airplane service between different Icelandic towns and the outer world, according to reports. The main base for air traffic will be Reygjavik.

White Monoplane Flight

(*Continued from page* 6)

ber, are spaced 15 ft. apart, and extend more than half the entire length of the machine, making capsizing impossible.

The pontoons are constructed of mahogany and cedar veneer and are divided into many compartments, sectioned with bulkheads. Each pontoon is capable of supporting the entire machine alone. They will render sinking the monoplane impossible, as it will float for weeks if necessary, and in case the entire pontoons and chassis should be torn away, the fuselage, being constructed in the same manner, will float as well as any boat. Thus, as the flight is over the steamship lanes, there is practically no chance of the crew perishing, even allowing for the most unforeseen developments.

The efforts of the George D. White Co. to be the first across the Pacific Ocean will not be so much an attempt to win the $50,000 prize offered by Thomas H. Ince as it will be to prove the reliability of the White monoplane. It goes without saying that a monoplane that will make a 7000 mile journey over strange waters with safety and success will be capable of all ordinary flying and be an excellent vehicle of air transportation.

It is uncommon to find a monoplane proposing to make the flight, as for the past some time biplanes have held the attention of the country. In explaining this Mr. White stated: "Why have we selected the monoplane? Because we know and all aeronautical engineers admit that the monoplane is far more efficient than the biplane. It is the parasitic resistance that is the bugaboo of aeronautics. It has been stated by Grover C. Loening, one of America's foremost aeronautical engineers, that for every pound of parasitic resistance eliminated ten pounds of useful load can be added. The average biplane uses up fully 60 per cent of its power to overcome this resistance, which is caused by struts, hundreds of feet of vibrating cable, etc. In brief, since this is not intended as a technical discussion, although I am willing to go into detail further should anyone desire, we have but 33 per cent of the resistance of the average biplane. Look at a view of the NC-4 or other large biplane, and then at the White monoplane, with its absence of struts and wires, and this will be clear.

"With 1500 lb. thrust and 60 per cent used up by parasitic resistance, only 600 lbs. thrust is actually being used for flying. Our resistance of 33 per cent is only 300 lbs. resistance out of 1500 lb. thrust, thus giving us either double the performance with the same power or allowing us to have the same performance with half the power used by a biplane."

It will be remembered that the first airplane across the English Channel was a monoplane, the first over the Alps was a monoplane, and the first plane to attain a speed of over 100 miles an hour was a monoplane. The only difficulty was the rather dangerous method of bracing monoplane wings with cables. The White truss system avoids this.

To sum up, the White Company hopes by its entry to cross the Pacific Ocean and develop a practical route that can be followed later in regular service. In view of the fact that great import trade is springing up with the Far East, a quick passage for mail and light express is a necessity. The route planned by George D. White is estimated to take three days, compared with three weeks by the fastest boat.

It is pointed out that should the rules of the Thomas H. Ince prize bar the White monoplane from participation due to the northern route chosen the flight will be made in any event. "The first plane will cost us nearly $50,000," said Mr. White, "and we do not intend to jeopardize our chances for the sole purpose of making a spectacular flight which will have no ultimate value."

Later it is planned to remodel the monoplane, substituting a landing gear for the floats, and attempt to make a non-stop flight from Los Angeles to Chicago.

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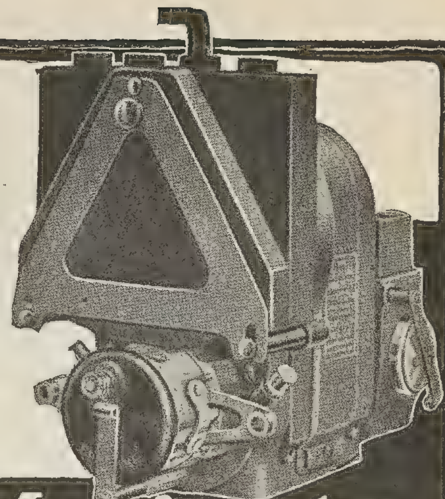

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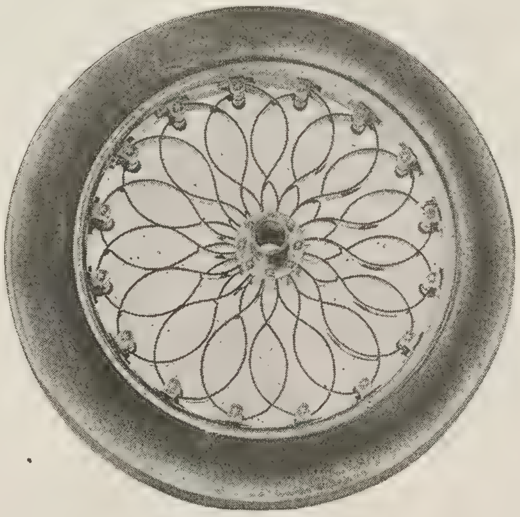

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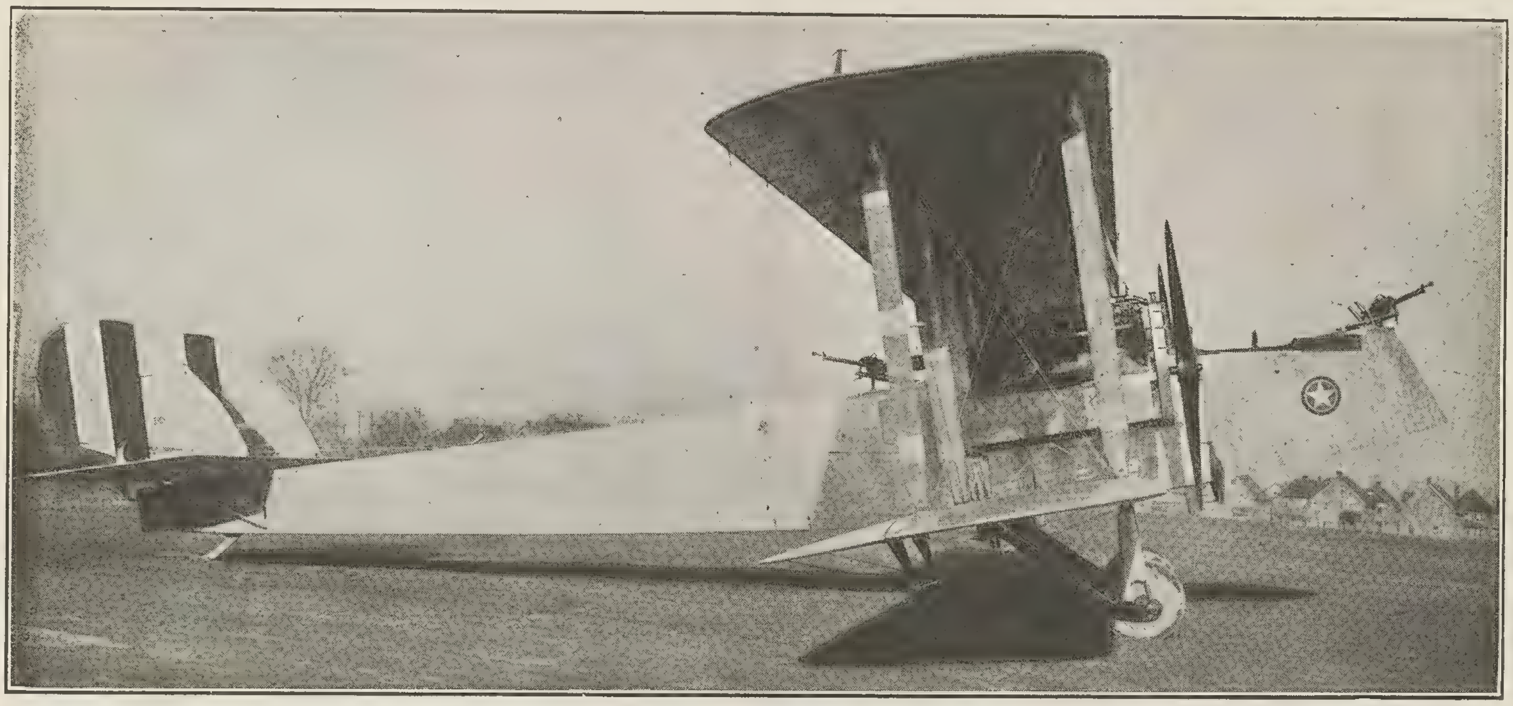
From an Airplane—Lieut. H. W. Sheridan Is Handcuffed



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Senator New's Bill Introduced in Senate; Referred to Committee on Military Affairs

The most important legislation that has been presented to Congress regarding the Air Service is the bill of Senator Harry S. New which was introduced in the Senate on July 31.

Other bills relating to the future of the Air Service have been introduced but none is as important as that of Senator New. It is the product of all the mature thought that many of the best informed persons on aeronautics could give and it deserves the most serious consideration.

The bill, which is reprinted in full in this issue of AIRCRAFT JOURNAL, was referred to the Committee on Military Affairs.

International Film Service.

SENATOR HARRY S. NEW

"HOW far behind the other nations will the United States start? Having created both the airship and the airplane, shall she permit herself to be completely outclassed in their development and utilization?" Senator New asks *the questions and he adds "I believe that the problem is one of very great importance to this country, sufficient to call for the creation of a single department of the Government to look after it to the exclusion of everything else. Great Britain was forced to this and so was France. The United States should do likewise and sooner or later she must do it."*

A BILL

To create a Department of Aeronautics, defining the powers and duties of the director thereof, providing for the organization, disposition, and administration of a United States Air Force, creating the United States Air Reserve Force, and providing for the development of civil and commercial aviation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby created an executive department in the Government to be called the Department of Aeronautics, and a Director of Aeronautics, who shall be the head thereof, and who shall be appointed by the President, by and with the advice and consent of the Senate; he shall hold his office for four years, unless sooner removed, and shall receive a salary of $10,000 per annum. The said director shall cause a seal to be made for the said department of such device as the President shall approve, and judicial notice shall be taken of said seal. The said Director of Aeronautics shall be responsible for the proper organization of the Department of Aeronautics, and it shall be within the jurisdiction of the Director to establish, from time to time, such corps, staffs, bureaus, divisions, sections, offices, or other departmental sub-units as are deemed by the said director to be necessary in the public interest for the proper maintenance, operation, and expansion of the Department of Aeronautics.

SEC. 2. That there shall be in said department an Assistant Director of Aeronautics, to be appointed by the President, who shall receive a salary of $6,000 a year. He shall perform such duties as shall be prescribed by the Director of Aeronautics or required by law. There shall also be one chief clerk, whose salary shall be $3,500 per annum, and a disbursing clerk, and such other clerical assistants, and inventors, inspectors, experts, scientists, and special agents as may, from time to time, be deemed necessary by the Director of Aeronautics. Until such time as Congress may enact laws creating an Auditor for the Department of Aeronautics, the Auditor for the State and Other Departments shall receive and examine all accounts of salaries and incidental expenses of the office of the Director of Aeronautics, and of all bureaus and offices under his direction and all accounts relating to all other business within the jurisdiction of the Department of Aeronautics, and shall certify the balances arising thereon to the Division of Bookkeeping and Warrants of the Treasury Department, and forthwith send a copy of each such certificate to the Director of Aeronautics.

SEC. 3. That the Department of Aeronautics shall, except as hereinafter provided, be charged with all matters pertaining to aeronautics for the Army and Navy, Post Office Department, Coast Guard, or any other department of Government in times of peace and war, for the improvement and development of science of aeronautics as may be deemed desirable in the public interests, for the purpose of extending commerce, and for such other utilization as may work to the betterment of the country; and said department shall be charged with the collection and dissemination of information relating thereto. That, at the direction of the President, the Director of Aeronautics shall, in time of peace and war, assign to the War and Navy Departments for duty with the Army and Navy such aeronautical units as, computed upon the basis of the prevailing size and disposition of the Military and Naval Establishments, the President shall deem necessary. The tactical employment of all such units while so assigned shall be under the exclusive control of appropriate military or naval commanders, and the personnel of all such units while so assigned shall be subject to the disciplinary laws and regulations governing the branch of the service to which said units shall have been assigned.

SEC. 4. That to the Department of Aeronautics are hereby transferred such part or parts of all corps, offices, bureaus, divisions, sections and branches of the Government as pertain to aeronautics now and heretofore under the War Department and the Navy Department, together with all official records and papers in their custody, and all military and naval air stations together with all land, buildings, furniture, apparatus, equipment, machinery, vehicles, vessels, and all other property of whatsoever description in the custody of the said air stations or corps, offices, bureaus, divisions, sections, and branches of the Government.

And the President is hereby authorized to transfer to the Department of Aeronautics at any time, such part, as to him may seem best, of any corps, offices, bureaus, divisions, or other branches of the Government as may be engaged in work pertaining to aeronautics.

And each and every function, authority, power, duty, and jurisdiction of whatsoever character it may be, vested at the time of any transfer aforesaid in the head of the executive department from which said corps, office, bureau, division, section, or other branch of the Government is transferred, shall to the extent which said function, authority, power, duty, or jurisdiction pertains to said corps, office, bureau, division, section, or other branch of the Government, immediately upon said transfer become vested, and hereafter remain vested, in the Director of Aeronautics. And all unexpended balances of appropriations available at the time of the above-mentioned transfers of corps, offices, bureaus, divisions, sections, and branches of the Government and the military and naval air stations for the use of any such transferred corps, office, bureau, divisions, section, or branch of the Government or military or naval air station, or other branch of the Government, or which may become available thereafter, or for the purpose of pay, additional pay, or allowances of officers, flying officers, enlisted men, or civilian employees thereof, or for any other purpose whatever relating to aeronautics, shall be and remain available in similar manner and to the same extent as if no transfer had been made.

That the Director of Aeronautics shall have charge in the buildings or premises occupied by or appropriated to the Department of Aeronautics of the library, furniture, fixtures, records, and other property pertaining to it, or thereafter required for use in its business. He shall be allowed to expend for the purchase of land, buildings, materials, machinery, vehicles, vessels, and apparatus required for the operations of the Department of Aeronautics in promoting, developing, and regulating navigation of the air, and for periodicals, and for the purpose of the library, and for rental of proper quarters for the accommodation of the Department of Aeronautics within the District of Columbia, and for all other incidental expenses, such sums as Congress may provide from time to time: *Provided, however*, That where any corps, office, bureau, division, or branch of the Government transferred by this Act to the Department of Aeronautics is occupying rented buildings or premises it may still continue to do so until other suitable quarters are provided for its use: *And provided further*, That subject to the approval of the Director of Aeronautics all civilian employees now employed in any of the corps, offices, bureaus, divisions, and branches in this Act transferred to the Department of Aeronautics are each and all hereby transferred to said department at their present grades and salaries, excepting where otherwise provided in this Act: *And provided further*, That all laws prescribing work and defining duties of the several corps, offices, bureaus, divisions, and branches by this Act transferred to and made a part of the Department of Aeronautics, shall so far as the same are not in conflict with the provisions of this Act, remain in full force and effect, to be executed under the direction of the Director of Aeronautics.

SEC. 5. That the United States Air Force shall consist of all commissioned officers and enlisted men serving in or assigned to the Department of Aeronautics, all reserves of said force, volunteers, or any other air forces acting as a part of or attached to the Department of Aeronautics. The personnel of the Department of Aeronautics, including the personnel above transferred or authorized or hereafter transferred thereto from the Department of War and Navy, shall consist of the commissioned officers and enlisted men comprising the Air Force and civilian employees. Commissioned officers of the Air Force shall be appointed as follows:

(a) From graduates of aeronautical schools.
(b) By transfer from the Army or Navy.

(*Continued on page* 10)

John D. Ryan's Acts Under Investigation

Charges Brought Against Former Head of Aircraft Production Board at Sub-Committee Hearing

Charges involving the official conduct of John D. Ryan, financier and formerly head of the Army Aircraft Production Board, were developed last week before the sub-committee on aviation of the special House Committee on War Expenditures. An additional inquiry to substantiate, if possible, the showing made will be conducted by the subcommittee, consisting of Representative Frear, Republican, of Wisconsin, chairman; Magee, Republican, of New York, and Lea, Democrat, of California. Cooperation in the investigation was promised by Newton D. Baker, Secretary of War, who was present at the hearing.

Secretary Baker at the hearing insisted that a full understanding of all the circumstances would show nothing reflecting upon Mr. Ryan, whom he regards as a high-minded, patriotic, devoted public servant and scrupulous in his business affairs.

In substance the charges are: First, that approximately $12,000,000 of Government funds were used by the spruce production division of the Aircraft Board to build thirty-eight miles of railroad ostensibly for logging purposes in obtaining spruce for airplanes, but really to complete an important missing railroad connection in the Pacific Northwest desired by the Chicago, Milwaukee and St. Paul Railroad, Mr. Ryan being a member of the executive committee and a director of the road.

Second, that while Mr. Ryan refused when director of the Aircraft Production Board to complete the contract for the building of the road, it was approved by Edward R. Stettinius, as assistant to the Secretary of War, that the president of the Milwaukee road was the chief adviser that the road be built, and that Mr. Sawyer, superintendent and engineer of the Milwaukee road, had charge of its construction, although the contract was awarded to the Siems, Cary & Kerbaugh Company.

Third, that while a logging road could be built for about $10,000 a mile, this road cost $100,000 a mile, exclusive of right of way, terminals and equipment; that it was of permanent construction, including tunnels, bridges, etc., and ran through country having no spruce except at one terminal, and that for the production of spruce needed by the War Department it was unnecessary.

Regarding the charges as to the building of the logging road, Mr. Baker said the War Department had made an investigation at the direction of the Chief of Staff and with the Secretary's approval. This investigation, he said, was made by Major M. H. Ray, under the personal supervision of the Inspector General of the Army, and the report was a complete exoneration of all connected with the operations complained of.

Mr. Frear asked the Secretary about an earlier investigation made by Major Howes, in which a sensational report was sent to the Chief of Staff reflecting upon the official conduct of affairs in connection with the spruce production division. The text of a telegram sent to the Chief of Staff by Major Howes was read into the record. It closed by saying:

"Preliminary investigation indicates that railroads are attempting to dominate the lumber industry of the Northwest at Government expense and in collusion with Government officials and Army officers. Indications of huge graft in large transactions, the complete investigation of which will involve large people and will call for a committee of great force. Any further work we might do at present might jeopardize a larger investigation, which will be necessary to prove contentions. The situation is very serious and calls for careful counsel. Wire instructions at once. Time important factor now."

Mr. Baker said he was aware of this report, and that it was because of it that he and the Chief of Staff ordered the investigation, which resulted in the favorable report made by Major Ray.

Mr. Baker read the conclusions of Major Ray's report, which were to the effect that the early report made by Major Howes had not been substantiated, that the evidence of graft and dishonesty had been disproven, that there had been no malfeasance in office, and that in general the work of the spruce production division had been commendable.

"In view of the publicity that has been given to this, I quite agree with you, Mr. Frear, that a final clearing up of the whole matter is desirable," said Mr. Baker, "and assure you that I will cooperate with you in every possible way. It is unfortunate, in my opinion, that aspersions have been cast upon men whose character I at least regard with the highest approval, and I am sure if a thorough investigation is made by your committee you will agree with me."

Curry Introduces Bill

A bill introduced in the House by Representative Curry, of California, proposes to combine in a new Department of Aeronautics all Government aviation activities, under the direction of a member of the Cabinet.

The Army, Navy, Marine and Postoffice aviation organizations would be combined in the new department, which would assume control of the commercial development of aircraft. Under the terms of the measure commercial development would be fostered and licensed by the department with certain limitations. Civilian aviators and aeronauts would be granted licenses by the department. Traffic rules and other regulations designed to prevent the recurrence of such disasters as the recent dirigible accident in Chicago would be made.

King Heads Air Force

King George has assumed the title of Chief of the Royal Air Force, and new titles for the commissioned ranks in the Air Force have been given by King George as follows: Marshal of the Air, corresponding with Field Marshal; Air Chief Marshal, corresponding with General; Air Marshal, corresponding with Major General, and Air Colonel Commander, corresponding with Brigadier General.

The idea in giving the ranks is to preserve the independence and integrity of the Air Force as a separate service. The titles will come into operation immediately.

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Wright Congratulated

The tenth anniversary of the delivery of the first airplane to the United States Government by Orville and Wilbur Wright, July 30, was made the occasion of a telegram of congratulation to Orville Wright from the Air Service. The message was signed by Major-Gen. C. S. Menoher and read:

> "The congratulations of the Air Service are extended to you on the tenth anniversary of the delivery of the first airplane to the Government of the United States, the first in the world to acquire a dynamic aircraft. The Air Service appreciates to the full the ever increasing debt owed by mankind to the Wright brothers, whose foresight, indefatigable research and practicable application have aided world progress through the invention of a new means of communication.
>
> MENOHER."

Ten years ago, on July 30, the United States acquired the first airplane and then this Government was the first in the world to be the possessor of an airplane. There were, however, no pilots until later in the season Wilbur Wright taught First Lieut. Frank P. Lahm, since Colonel, and First Lieut. B. D. Foulois, since Brigadier General, American Army officers, how to fly.

On July 30, 1909, Orville Wright and B. D. Foulois together made the second and final trial flight with the Wright machine contracted for by the Government the year before. This was a cross country trip of five miles in each direction, with and against the wind. The speed made was 42 miles an hour. On July 27 the endurance test of one hour was made in a flight which totaled 72 minutes, with Lieutenant Lahm. Lieutenant Lahm has the distinction of being the first American Army officer to fly.

While the Wright Brothers were negotiating in foreign countries for the sale of patent rights, they were communicated with by the United States Government, and in the winter of 1907 the Chief Signal Officer, General James Allen, advertised for bids for an airplane. Of 22 bids three were accepted. The Wright Brothers were the only ones to deliver a machine. In September, 1908, official demonstrating flights were begun at Fort Myer, near Washington, in the fulfilment of the contract, but the death of First Lieut. Thos. E. Selfridge, passenger, and the accident to Orville Wright, the pilot of the machine, postponed flights until 1909.

The contract price of the machine was $25,000. The maximum speed demanded was 40 miles an hour, with a bonus of 10 per cent for each mile per hour in addition. The Wrights received $30,000 for a speed of 42 miles per hour. This was paid out of the funds of the Board of Ordnance and Fortification.

R-34 Surprises London

The R-34 paid London a surprise visit on the evening of July 30. Ever since her arrival from New York she had been at the Pulham aerodrome in Norfolk. She set out at 5 o'clock in the afternoon to return to her own quarters at East Fortune.

It was decided to let Londoners have a chance to see her before she went north so at 7 o'clock she appeared over the city, having taken two hours to cover ninety miles. She was flying a white ensign from her stern. At a height of a thousand feet she cruised around for a considerable time, following the course of the river, turning at St. Paul's, and then pursuing a meandering line west and northwest until she disappeared in the mist.

Rohlfs Sets New Official Altitude Record

Curtiss Test Pilot Ascends to Height of 30,700 Feet at Roosevelt Field in Wasp Triplane with 400 Hp. Engine

Roland Rohlfs set a new official world's altitude record at Mineola July 30, when he ascended to a height of 30,700 feet in a Curtiss Wasp triplane, equipped with a 400-hp. K-12 engine. The previous record was for 28,900 feet, set by Major, then Captain, R. W. Schroeder, U. S. A., in a Bristol, at McCook Field, Sept. 18, 1918.

The best unofficial altitude flight on record was made June 14 last at Villa Coublay, near Paris, by Adjutant Casales of the French Army, when he reached a height of 33,136 feet.

Rohlfs' flight was made under official auspices at Roosevelt Field. He left the ground at 2:33 o'clock and landed at 5:28.

Rohlfs found himself in a temperature of 25 degrees below zero, with a wind blowing 100 miles an hour, when he reached the top of his climb of nearly six miles, the intense cold causing trouble with his engine. He cut up the pillow of his seat and tried to use the stuffing to protect parts of the engine from the cold, but this was blown away as fast as he put it in place. Rohlfs then climbed out on his machine to cut a water pipe when he thought that cold water from the pipe was helping to chill the engine, but he found it difficult to leave the controls unguarded and finally had to start downward without achieving the record credited to Casale. He said afterward that he believed he could have beaten Casale's record if the engine had been a little better protected against cold.

Rohlfs landed with a dead engine, having used the 57 gallons he carried practically in its entirety.

The oxygen which the pilot breathed when so high that the air was too thin to sustain life of itself, and the supply he had taken with him, was almost exhausted when he had finished with his desperate attempts to keep frost from invading the engine, and he had no assurance of keeping life in his body if he continued his efforts to buck a few thousand feet higher through the arctic blizzards he found at that height. During part of the flight he was forced to work his gasoline pump by hand. Rohlfs was protected by a heavy fur-lined suit, with his face completely covered by a hood with inset goggles.

A better day for the attempt could not have been desired, and the take-off when at length the engine began to function was perfect. The machine taxied not more than a dozen feet before lifting, and Rohlfs began to climb. For the few minutes the plane remained in sight the vision of the gallery was focussed on it. The Wasp swept over the field in wide circles, gaining altitude rapidly.

Up to about 15,000 feet it remained in view to the sharp-sighted, although at that height only a spot in the sky. Almost three hours later Rohlfs brought his machine to a perfect landing on the edge of the field, some distance from the hangars.

The official reading taken from the two sealed recording barographs carried in the triplane gave an altitude of 30,700 feet. Both readings were identical. Little doubt is felt that the instruments will be found accurate, inasmuch as they had been subjected to careful tests before the flight was undertaken.

An official board appointed by Col. Archie Miller in command of the flying fields on Long Island, and consisting of Lieut.-Col. W. L. Moose, Major J. E. Rossell, Major Harry F. Miller and Capt. A. E. Samoni witnessed the test. Many officials of the Curtiss plant were present, and a number of women were the guests of the official party. Among them were Mrs. Rohlfs wife of the Curtiss Aviator.

Rohlfs' machine weighed 1,900 pounds. It had a wing span of thirty-two feet and half an inch and was twenty-three feet over all in length. It was intended for use in the war as a two-place machine-gun fighting plane, but it was not ready before the armistice was signed. The plane is noted for its excellent streamline, which is not only pleasing to the eye, but as well mechanically and aerodynamically correct.

Roland Rohlfs, Who Set New World's Altitude Record
(c) *Keystone View Co.*

Rohlfs will make another flight soon, when, with additional protection for the engine, he hopes to ascend 35,000 feet.

The new holder of the record has been flying for about three years. Before taking up the flying end of aviation he was a mechanic for the Curtiss Company at Buffalo. He learned the knack of flying in a remarkably short time and, during the war, was chief test pilot, flying all the various types of machines manufactured by the company during the war.

When the Curtiss Engineering Corporation was formed for the purpose of carrying on all experimental work, he was transferred to Garden City. His knowledge of motors and aeronautical design especially qualified him for the work a test pilot has to do in the way of testing actual performances of airplanes.

He has flown the Wasp on his three record-breaking trips, and recently made a non-stop flight from Buffalo to New York in a Curtiss Oriole, three-passenger land machine—the first non-stop flight made by a small machine over that distance. Previous to his two performances with the Wasp, his best altitude record was 26,300 feet, made at Dayton, Ohio.

He is 27 years old and was born in Buffalo. His mother is Anna Catherine Green, the author. He now lives at Westbury, L. I.

Flights on the Coast

U. O. Riddle, representative for the Washington Auto company at Toppenish, Wash., is making reservations for flights on a Curtiss airplane which will arrive shortly. The plans will be in charge of an Army aviator who will remain two days.

Later, when a suitable landing field has been obtained, two Army planes will be sent to Toppenish to make flights under the direction of the Army recruiting officers.

Coast-to-Coast Mail

Trans-continental air mail service between New York and San Francisco is provided for in a bill introduced in the House of Representatives last week by Representative Kahn, of California, Chairman of the Commmittee on Military Affairs. Mr. Kahn will urge passage of the bill when the House reconvenes in September. Under the provisions of the bill Mr. Kahn would have the Post Office Department designate additional points between these cities to which air mail service might be given.

"I believe that with an efficient air mail service between the two chief cities on each coast the time required to transport mail across can be cut in half," said Mr. Kahn. "I am informed that the flying time between the two cities, with a system of relays, can be reduced to about forty-five hours, which is about half the present time of the fastest mail service."

Edward McGrath, in charge of maintenance and operation of the Air Mail Service, has been in California conferring with Government and State officials in regard to the proposed coast-to-coast service. He will shortly submit a report to the Postmaster-General. McGrath declined to discuss the project but commented that "San Francisco has every reason to hope for an adequate aerial mail service. The postal authorities in Washington have had to recognize San Francisco's demands for an aerial mail service up and down the Pacific Coast and across the continent."

According to the *San Francisco Bulletin*, it is planned to carry the mail by plane from New York to Green River, Wyoming, from which point it will be brought to San Francisco by the fast overland mail train.

New Air Mail Schedule

A revised air mail schedule between New York and Washington, by which the mail from New York and New England will reach Washington in time for the early afternoon delivery and the mail from Washington and Southern connections to New York will reach there about 1 o'clock, has been authorized by the Post Office Department.

The air mail will hereafter leave New York at 8:40 a. m., arriving in Washington at 11 a. m. Operating on this schedule all New York City mail which reaches the postoffice too late for the midnight train for Washington and all New England mail reaching New York between midnight and 8 a. m., will be carried by airplane to Washington.

On the northbound trip the mail will leave Washington at 10 a. m., reaching New York about 1 o'clock for middle afternoon delivery.

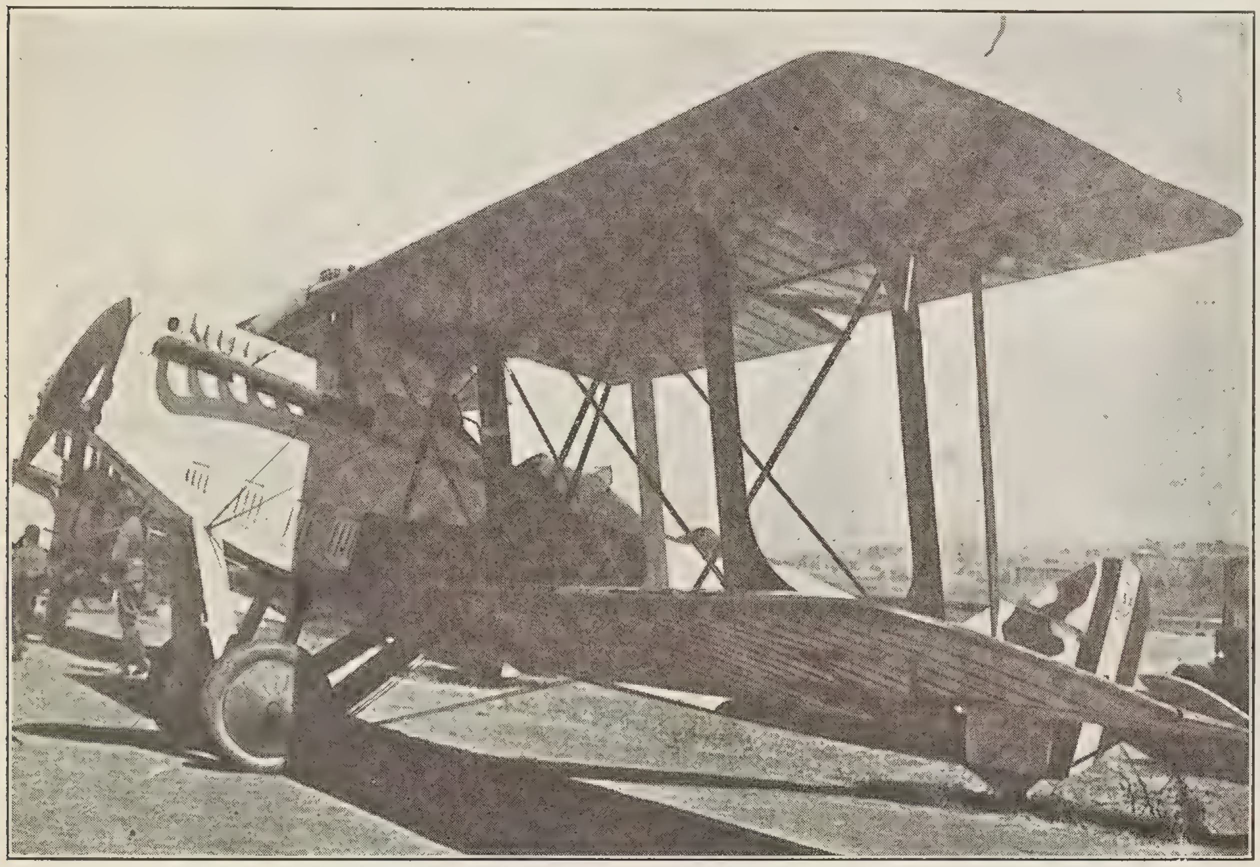
"Public appreciation of this improvement of the service finds expression in many commendations from people in Washington which I receive," declared Postmaster Chance of Washington.

Pasadena Landing Field

Pasadena, Cal., has established a municipal landing field near the Altedena Country Club covering 60 acres with all the equipment of a first class landing field.

New Records Set in Busy Week of Flying

Excellent Flights Supplement New Marks for Speed Gliding and Altitude Set by American Aviators



LePere Plane, Type Flown by Major Schroeder
Photo International Film Service.

Schroeder Sets Record

Major R. W. Schroeder, U. S. Air Service, set a world's speed record for high altitudes, it is claimed, when he flew at a rate of 137 miles an hour at a height of 18,400 feet, Aug. 2. He used a two-seated LePere biplane, designed by Captain LePere of the French Army. It was equipped with a twelve-cylinder Liberty motor and a supercharger, Lieut. G. W. Elfey, observer, was a passenger.

According to Capt. B. G. Patterson, in charge of the performance computation at McCook Field, this latest development will have a marked effect on aerial navigation, because it will enable a pilot to fly at full speed and full power above the storm zone. It will also be potent in trans-oceanic flights, and would make easy non-stop trips between New York and Chicago, regardless of weather conditions.

The supercharger is an attachment consisting of a gas turbine and centrifugal compressor, deriving its power from the red-hot exhaust gases of the Liberty motor. It feeds the compressed air into the carburetor at the same pressure as at sea level, so there is no lack of oxygen regardless of altitude.

It was designed by Dr. Sanford A. Moss, who worked on it for eighteen months.

London to Madrid

An airplane from the Alliance Motors Corp., London, made a flight from the British capital to Madrid, Spain, nearly 900 miles, in 7 hours and 45 minutes last week, an average speed of 116 miles an hour. This is the first non-stop flight between these two cities. The machine was equipped with two Napier engines.

Pike's Peak Circled

Lieut. Alexander Lendrum, of Colorado Springs, accompanied by Ira J. Humphries, of Denver, and L. L. Sipple, a photographer, circled the summit of Pike's Peak for the first time Aug. 4, reaching a height of 14,200 ft.

148 Miles an Hour

Flying in a LePere airplane at an altitude of 6,000 feet Lieut. J. D. Corkville, with Sergt. J. R. Cook, made a flight from Arcadia, Fla., to Daytona Beach, Fla., a distance of 186 miles, in 75 minutes, or at a rate of 148.8 miles an hour, Aug. 1, according to an announcement from the Air Service.

Lieut. R. H. Smith, with Lieut. W. L. Williams and Lieut. R. J. Johnson, flew from Arcadia, Fla., to Jacksonville, Fla., in a De Haviland at an altitude of 5,000 feet and covered the distance of 265 miles in 127 minutes. This is a record flight between the two points. The temperature at 4 o'clock at the altitude of 5,000 feet was 65 degrees, while on the surface the thermometer registered 92 degrees.

Major W. J. Frank of the administrative department of the Air Service, Washington, in a De Haviland-4, with Lieut. Robert F. Midkiff, made a flight from Mineola, N. Y., to Amherst, Mass., 140 miles, in 60 minutes. The railroad time between the points named is five hours.

An aero photographic expedition, consisting of twelve officers and men in six Curtiss planes, left Langley Field, Virginia, at 3:55 o'clock Aug. 1, for Richmond, Va., for a ninety-day tour of Virginia, West Virginia, Maryland, Delaware, New Jersey and Pennsylvania. Stops will be made in forty-six cities. Following the expedition are motor trucks equipped with all apparatus for aerial photography in all its phases, including motion pictures.

Flights in Hawaii

Flights with mail are now being made to Hilo on the Island of Hawaii, an outward distance north of Molokai and Maui of 230 miles. The return trip is south of Maui over the Alalakeiki Channel, the Auau Channel north of Lanai and south of Molokai, a distance 215 miles, according to a letter from the Governor of the islands. The latter states that instead of going on a small steamer for a journey of two days, letters were carried by airplane in two hours.

New Gliding Record

What is said to be a world's record for airplane "gliding" was established at Ithaca, Aug. 2, when "Tex" Marshall, attained an altitude of 17,000 feet, shut off the engine of his Thomas Morse plane at the northern end of Cayuga Lake and "glided" thirty-five miles to Ithaca, renewing his power at an altitude of 6000 ft. Twenty-two miles is said to be the former record.

Plane Crosses Carpathians

The first airplane to cross the Carpathians from Russia to Austria reached Vienna July 30 from Ukrainian headquarters at Kamenetz, Podolia. The machine carried twelve passengers and made the 600-mile non-stop flight in seven hours.

The airplane was confiscated, with money and diplomatic documents it contained, by an English officer, who has notified the Ukrainian Government that he is acting in the name of all the Allies, since the Ukrainian Administration has not been recognized. The Ukrainians are sending a protest to Paris, stating that this was their only means of communication, since the Allies helped the Poles to occupy East Galicia.

The large colony of Ukrainian refugee patriots here, driven from their homes by the Poles, are much disheartened by the incident, claiming that they are doing everything possible to win the friendship of the Allies and also to fight the Bolsheviki.

Over the Andes

Lieutenant Locatelli, a member of the Italian Aviation Mission now in Argentina, completed an airplane flight from Buenos Aires to Valparaiso July 30, his trip marking the first crossing by air of the South American continent from the Atlantic to the Pacific.

Lieutenant Locatelli several days previously had covered the first stage of the flight, from Buenos Aires to Mendoza, on the eastern edge of the mountains, where he waited for good weather. He started early in the morning to complete the flight, crossed the Cordillera of the Andes, and after circling over Valparaiso landed at Vina del Mar, near that city. In the afternoon he flew to Santiago, landing at the aerodrome of the Chilian Military Aviation School.

The Italian aviator acted as an aerial mail pilot on this trip, bringing several sacks of mail matter from the Mendoza post office, and a number of private letters. He was heartily greeted on landing in Chili by members of the Italian colony.

Lieutenant Locatelli saw service during the war on the Italian front. He took part in one of the raids over Triest by Gabriele d'Annunzio's squadron.

Lisbon-Rio Flight Prize

A prize of $1,500 for the first Brazilian or Portuguese military aviator to fly between Lisbon and Rio de Janeiro is proposed in a resolution that has been introduced in the Brazilian Chamber of Deputies. The measure calls for the government to finance preparations for the flights up to an amount not exceeding $150,000. It is provided that the flight shall not require more than 168 hours.

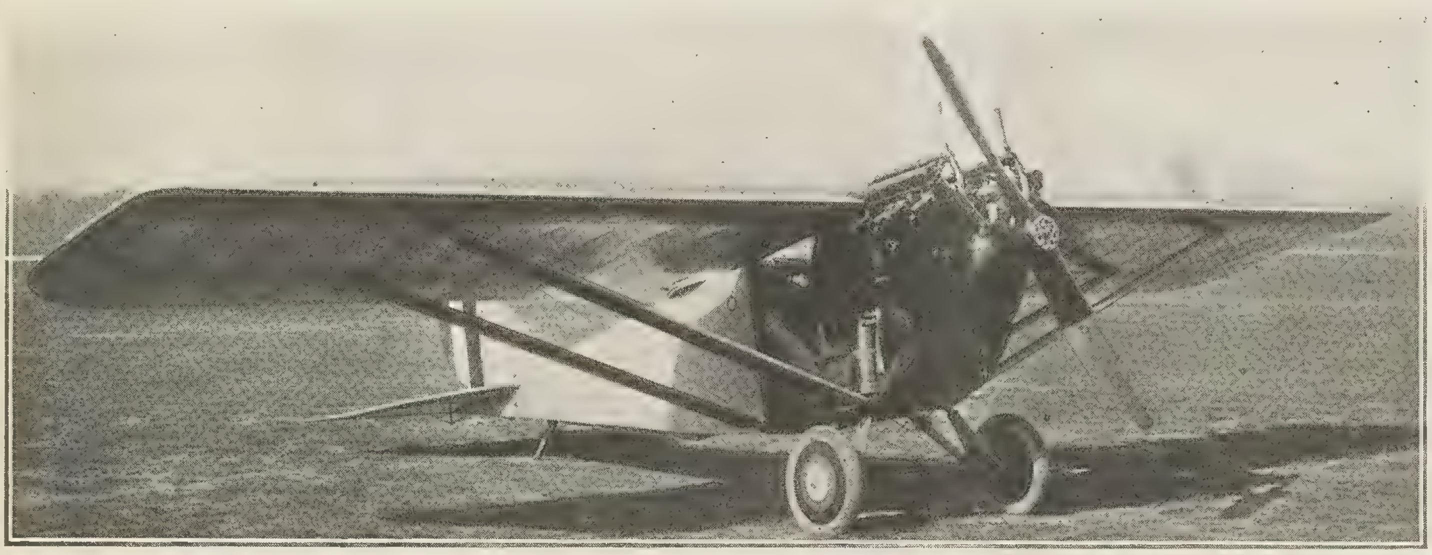
The Portuguese government on June 6 offered a prize of 30 contos (approximately $32,400) for the first Portuguese or Brazilian aviator to fly from Portugal to Brazil.

The World's Airplanes and Seaplanes

The Loening Monoplane

In its actual performance, the Loening monoplane has, with the full two-seater load carried by the De Haviland, LePere, Bristol, etc., not only exceeded all the performances of these machines, but has with the same load equalled, if not exceeded, all of the performances of the best European single seaters with the same engine, such as the Spad, Sopwith, Martinsyde, etc. This machine, with a load almost equal to its own weight, climbed 16,000 ft. in 18 min., and on one occasion climbed to 24,000 ft. in 43 min.

The American aviation world has followed the progress of this new design with great interest, and there is a somewhat general regret that the war should have ended before this machine could demonstrate, in actual service, the superiority of American high-speed fighter design.



THE LOENING MONOPLANE

POWER PLANT

Hispano-Suiza motor, Model H.
340 h. p. at 1,800 r. p. m.
Weight with propeller, 618 lbs.
Fuel consumption per h. p. hr., 0.53 lb.

MAIN DIMENSIONS

Span	33 ft. 4 in.
Overall length	23 ft. 9 in.
Overall height	6 ft. 8 in.
Chord	7 ft. 0 in.
Dihedral	1 deg.
Propeller diameter	8 ft. 8 in.
Span of elevator	9 ft. 6 in.
Area of main plane, total	238.9 sq. ft.
Area of upper planes with ailerons	214.9 sq. ft.
Area of strut planes	24.0 sq. ft.
Area of ailerons (2)	24.0 sq. ft.
Area of fin	8.8 sq. ft.
Area of stabilizer	14.9 sq. ft.
Area of rudder	9.0 sq. ft.
Area of elevator	15.0 sq. ft.

MAIN WEIGHTS

Weight (including water)	1,130 lbs.
Fuel and oil	290 lbs.
Useful load (includes pilot and passenger)	1,188 lbs.
Total weight of machine	2,608 lbs.

PERFORMANCES

Altitude.	Speed.	Climb.
Ground	146 m. p. h.	0 min.
20,000	....	20 min.
24,000	....	......

STRUCTURAL CHARACTERISTICS

One of the most important contributions to the art of aviation that is made by the Loening monoplane is in the novel design of the wing structure, which gives great strength against drift stresses and makes the whole machine a rigid unit, quite as strong and solid against twisting stresses as any biplane.

An interesting feature of the machine is the manner in which the wings fasten to the upper body longitudinals, and are braced by two enormous struts to the bottom of the body. This method of bracing is very light and simple to construct.

The landing speed of the machine is very low, despite the fact that the wing loading has been gradually stepped up to almost 12 lb. per sq. ft. The wings, body, tail surfaces, landing gear, etc., are all built of most approved spruce and metal airplane construction. All sorts of maneuvers have been frequently undergone and there is no evidence that the wing structure is weak in any way. Sand load tests of the machine show a safety factor of 14 on drift stresses and a safety factor of 8 on lift stresses.

The gun range is also very good, particularly forward, the only obstruction being the arc of the propeller. The radiator is placed below the engine, where it gets a good blast of air, and it can also be easily shuttered. The engine is left out in the open, and it is found while it vastly improves the performance of the engine, it does not increase the head resistance greatly.

In exhaustive tests on flight performances the machine was found to get off the ground in 4 seconds, from a dead start, and that in flight the machine is very easy to handle on all its controls in spirals, loops, barrel rolls, etc.

Michigan Airplane Factory

Incorporation papers of the Texas Aeroplane Manufacturing Company will be filed soon. The company will have a paid-up capital stock of $1,000,000 and its purpose is to construct and operate an airplane manufacturing plant at Grand Rapids, Mich. Lieut. C. G. Taylor, Lexington, Ky., is chief promoter of the project.

May Destroy Zeppelins

Germans in charge of twenty-four Zeppelins near Berlin have threatened to burn them rather than deliver them to the Allies, as required by the Peace Treaty, according to information obtained by the American Army authorities at Coblenz, it has been learned. The Zeppelins are of twenty-five tons capacity and can fly from Berlin to San Francisco, according to German sources. Several were built to carry forty persons.

The Germans are said to be seeking permission to fly the Zeppelins to the United States, hoping to find buyers for the airships there. If this permission is not given, according to Army information here, or some other satisfactory solution offered, the Germans will destroy the airships rather than surrender them.

Aeromarine Engine Tests

An Aeromarine L-6 engine—130 hp., rated 125 to 130 hp. at 1625 r.p.m.—has passed official tests at the Washington Navy Yard, running fifty hours without grinding a valve.

Alaska Aeronautics

The Alaska Aircraft Transportation Company, of Seattle, Wash., incorporated under the laws of that state for the purpose of building and operating airplanes in Alaska for carrying freight and passengers, will locate its first flight field, hangar and shops at Valdez. Ultimate plans call for fields and fuel stations at all important interior Alaskan points to supplant the present difficult methods of transportation.

Tod M. Date, president of the company, has had twelve years' experience with transportation problems in the North. Associated with him are engineers and designers of ability from various aircraft factories. Mr. Date was formerly associated with the Standard Aircraft Corp., at Elizabeth, N. J., and the Naval Aircraft factory at the League Island Navy Yord.

The plane to be used is being designed to carry approximately six tons of freight. It will have a total supporting surface of 3360 ft. and will be driven by four engines developing 1600 hp., or 400 hp. for each engine.

"Commercial Aviation"

An interesting booklet entitled "Commercial Aviation and its Relation to the Community" has just been issued by the United Aircraft Engineering Corporation, of New York. It is the first of a series which will show in true light the present status of commercial aviation and its future possibilities.

Considerable space is given to airdrome construction and the illustrations of various types of landing fields are especially clear. Other pages are devoted to types of aircraft, speed, endurance, landing, load, altitude, safety, cost, cost of operation, performance, etc.

While it was originally intended that the distribution of these booklets would be limited, it is now possible for all interested in commercial aviation to secure a copy until the present supply is exhausted. Requests should be made to the Engineering Department of the United Aircraft Engineering Corporation, 52 Vanderbilt Avenue, New York City.

American Aids Bolivia

Capt. Donald Hudson, formerly a member of the famous first pursuit group of the American Expeditionary Forces in France, has been employed by Bolivia to organize and instruct flying corps in its Army.

It was said at Washington last week that Bolivia had decided to secure instruction for its Army by discharged American officers after it had failed to secure admission of picked cadets to the West Point Military Academy. The American Government explained that at this time it was impracticable to accept more foreign students at the American school.

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Formerly Air Service Journal

Senator New's Bill

THE introduction by Senator New of his bill to create an indedent Air Force will be welcomed by those who wish to see aeronautics in the United States play a proper part in the scheme of national defense. The bill gives indications of careful preparation and has in it the foundations of an organized Air Force on which can be built a structure worthy of this country's position in the air.

Before it will come before the Senate for discussion, it will have to be gone over carefully in committee and for this reason it is reported in this issue in full so that those interested may have an opportunity of giving it careful study.

Congressional Investigations

IT would appear that the Air Service is to be the happy hunting-ground of Congressional committees for years to come. No sooner is one investigation ended than another is begun. Mr. John D. Ryan and the A. E. F. bonfire of salvaged planes and motors are the latest objects of attack. Mr. Ryan, whose directorship of the Air Service was of so little moment that he himself is the first to give credit to others for the real accomplishments, has been criticised for his connection with the railroad building in the Northwest by the Spruce Division. The Secretary of War has come strongly to his defence and probably little more will be heard of this attack.

The bonfire story has been in circulation for several months. Major General Menoher was questioned about it by the House Committee on Military Affairs. Returned officers and enlisted men have brought home stories of new planes being burned and new motors being delibereately ruined so that they could be salvaged. It is probable that the officers in charge of the salvaging will have a good answer to the charges. When it is remembered that thousands of planes and motors were used continuously on the other side for a long period, it becomes apparent that many must have been ready for burning. The safest method of disposing of wrecked planes is by the bonfire. Any other plan of salvaging is sure to result in the reissue of parts that may be weakened and dangerous.

Civilian Flying

THE great increase of civilian flying in all parts of the country due primarily to the availability of training planes used by the Government has started a movement which will probably result in the development of the yearly models by construction. Already there is talk of the " 1920 Models " and it is significant that they are laying emphasis on comfort and reliability. To have the airplane come into its own as a passenger vehicle, many changes which provide for the convenience of travelers will have to be made. It is encouraging to note that this is being done.

The availability of airplanes for civilian flying will in all probability also lead to the resumption of competition of various kinds, " Aerial Derbys " so-called, that were popular and interesting here before the war and that are in Great Britain much more enthusiastically received now than in the experimental days before 1914. It is to be hoped that these will be sensibly conducted for the advancement of aeronautics and not as wild as circus schemes or mere sporting or advertising propositions.

Aerial competition can be utilized to excellent purpose. It can be used to determine the durability of both engine and plane in long non-stop flights. Tests for useful load aside from fuel will be valuable, while the determination of the ratio of ton-miles of fuel consumed is important economically.

Recruiting with the NC-4

RISKING the famous NC-4, the first aircraft to cross the Atlantic, for a recruiting and exhibition flight around the country can hardly be commended as good policy on the part of the Navy Department. With the two sister-ships of the NC-4 that started the memorable flight with her out of commission, one wrecked and the other lost, it would seem to be tempting fate with one of America's greatest relics to fly the NC-4 on rivers and harbors where a floating log or some other obstruction might sink her or do damage beyond repair.

If recruiting is so essential for the Navy, some method less dangerous to what can be regarded as a trophy of the greatest public interest, as well international as distinctly American, should be devised.

Secretary Crowell's Report

THAT the report of the American Aviation Commission headed by Assistant Secretary of War Crowell, which recently returned from Europe after an extended study of Allied air establishments, will give much interesting information is certain. At the present time it is being studied by the War Department, which has as yet given no part of it to the press.

The report of the American Air Commission ought to be open to the public as soon as possible. A delay can be of no benefit and there are many who will be able to profit from the investigation that was made of aviation in England, France, Italy and other European countries.

The R-34 from the Airplane Engineer's Point of View

IN viewing the R-34 the engineer, who has been mainly concerned with the design and construction of airplanes, is awed by the size of the structure, but a number of criticisms arise in his mind.

The shape of the dirigible itself offends his idea of streamline. He has been well drilled in the fact that a fineness ratio of 6 or 5 to 1 gives the best aerodynamic efficiency. The dirigible has a fineness ratio of 11 or 10 to 1, it is merely a cylinder rounded off at the ends. The necessities of a simple internal structure do not justify the increase in resistance this shape entails.

The streamline of the cabins is ridiculously crude.

The connection of the cabins to the keel is not refined; struts and wires appear in profusion, and their number could be considerably reduced. Streamline wire is nowhere employed.

The tail surfaces are of the flat uneconomical type, which besides offering a poor shape in themselves, require an unnecessary amount of bracing.

Connections and fittings are unrefined. The finish seems very poor throughout.

No doubt when seen in flight and when its achievements are examined the R-34 is impressive, but it seems to be in the primitive stage which the airplane passed many years back.

News of the Army and Navy Air Services

Medical Tests Flight

The longest flight on record for medical officers of the American Army has been completed with the arrival at Carlstrom Field, Arcadia, Fla., of Major S. M. Strong and his associates. The medical flyers made the round trip to New York, 2972 miles, in 2851 minutes.

The flight, which was under the command of Major Strong, was made in three Curtiss airplanes, equipped with Hispano Suiza motors. Stops were made at twenty cities. Considerable delay was caused by bad weather, but no attempt to make fast time was made.

Participating in the flight were Major Strong, Lieut. Ray W. Brown, Capt. John H. Timberman, Lieut. John M. Langley, Lieut. Frederick Austin and Sergt. H. K. Rasch, mechanic. The pilots were Major Strong, Lieuts. Brown, Langley and Austin.

The trip was made exclusively for the purpose of studying the qualifications and requirements necessary for an aviator to possess from a medical standpoint. Moderate changes in blood pressure were noticed during the entire trip. Wax was used in the ears as a protection against vibration and air pressure without diminishing the hearing. Major Strong will prepare a special report.

War Pay to Continue

Wartime pay for soldiers will be continued despite newspaper reports that wages will revert to the pre-war scale under the new Army Appropriation bill.

The Adjutant General in assuring recruits that the war pay will continue pointed out that a provision in the Appropriation bill for the fiscal year of 1920 that the act of May 18, 1917, in so far as it increases the pay of the enlisted men of the army, continues in force.

Demobilization

The Air Service reports a net decrease in strength from the date of the armistice to July 17 of 91 per cent.

The following table shows the present distribution of personnel as compared with the latest revised figures for November 11, and the per cent. decrease. The July 17 figures do not include 330 officers and 3,796 enlisted men in transit or at demobilization stations awaiting discharge.

	November 11.	*July* 17.	*Per cent net decrease.*
Cadets	6,483	6	99.9
Enlisted men	167,986	13,702	92
Officers	20,554	4,432	78
Total.......	195,023	18,140	91

4844 DeH.-4's Produced

The Bureau of Aircraft Production received during the week ended July 15, two De Haviland-4 planes, making a total of 4,844 produced to date.

The table shows deliveries of De Haviland-4 planes (including 204 without engines used in A. E. F. as spares) before and after the armistice:

	Deliveries.	*Per cent of total.*
Before armistice	3,431	71
After armistice	1,413	29
Total.............	4,844	

Forest Fire Patrol

Aviators and observers from three of the most active flying schools of the Air Service are continuing their work of patrol over the great forests of California with remarkable results, and are receiving the commendation of the forestry commission for the great work accomplished.

Radio Telephony

Radio telephone communication has been regularly established between Langley Field and Fort Monroe and Fort Story. Radio telephone developed by Air Service and Signal Corps is used. The maximum distance covered is 30 miles. Recruit operators are being used at Langley Field taken from recruit radio class.

Col. C. C. Culver,
Whose Work in the Development of the Wireless Telephone Has Gained Him a National Scientific Reputation
(c) *Harris & Ewing.*

The radio telephone is to be used for maintaining direct and constant communication between the forts and 74th Army Artillery Squadron.

Recruits for Shawmut

Mechanically inclined men who desire to go to sea will be accepted for service aboard the U. S. S. Shawmut, the only aviation mother ship in the Navy. Lieut. Myron F. Eddy, flight officer in charge of aviation recruiting in this district, has announced that the Shawmut is releasing aviation mechanics in accordance with orders received recently, and that the vacancies will be filled by men enlisted at 34 East Twenty-third street, New York.

The Shawmut acts as tender for ten seaplanes and will be attached to the Atlantic fleet. Four of the seaplanes are carried on board ship. The other six are known as air boats—big seaplanes of the F-5 type. Air boats are flown from port to port, and engage in all fleet maneuvers. The Shawmut will proceed to Newport soon for aerial bombing practice and for seaplane observation of torpedo tests.

To Sell Seaplanes

The sale of 265 Navy seaplanes has been authorized by Secretary Daniels, it was announced Aug. 2, by Acting Secretary of the Navy F. D. Roosevelt.

Mr. Roosevelt said that the sale of these machines will give commercial airplane transportation companies an opportunity to buy high-speed machines of large carrying capacity ready for immediate delivery. He said that a number of such routes are already in operation or contemplated in the near future, such as from New York to Atlantic City, San Pedro to Santa Catalina, Key West to Havana, Chicago to Milwaukee and other lake cities, and a projected route to the Bermuda Islands.

The sale will include 83 RS-2 pusher biplanes, each with 330 hp. Liberty motors; also 72 H-6 and F-5 tractor biplanes, each with two 330 hp. Liberty engines.

The Bureau of Supplies and Accounts, salvage and sale section, will issue complete schedules of the sale, giving the characteristics of all the machines to be sold, their location, appraised value, specifications and terms.

Navy Air Station Retained

Mechanics are being enrolled for duty at the Rockaway air station, which is to have at once its full complement of 300 men, acording to an announcement from the Navy Department. Ninety-five per cent. of the personnel now on duty there will be released by Aug. 15, and authorization has been granted for replacement by enlistment in the New York district.

New men will be enrolled for two years. Lieut. Myron F. Eddy, a flight officer from Rockaway, has been detailed as aviation aid to Lieutenant-Commander Wickersham to enlist these men at the Navy recruiting office, 34 East Twenty-third street.

Machinists, carpenters and other mechanics competent to enlist for work on seaplanes will receive from $55.50 to $83 a month and subsistence. Their pay is increased to 50 per cent. more than this when they become members of seaplane flight crews.

Flight for the NC-4

The NC-4, first aircraft to cross the Atlantic, may attempt a flight to the Pacific coast for exhibition and recruiting purposes, Senator Phelan of California announced last week, after a conference with Secretary Daniels.

"Plans are now under consideration," said Senator Phelan, "to have the NC-4 make a flight across the continent, stopping at many of the large centres. It should do much good in the matter of enlistments."

The NC-4 early in September will start from Maine for a cruise to Galveston, Texas, according to an announcement by the Navy Recruiting Station at Portland. The seaplane will be accompanied by the Isabel, a converted yacht, and will be anchored for exhibition at the principal coast cities. She will be under command of Lieut. Commander A. C. Read, who directed her flight across the Atlantic.

"Airship" and "Airplane"

To settle difficulties of terminology which have arisen with the development of aeronautics the Air Service has officialy decided to use the word "airship" only to designate dirigible balloons and other lighter-than-air craft. All heavier-than-air craft will be designated as "airplanes."

Newark Postmaster Up

James F. Sinnott, postmaster of Newark, N. J., made a flight in a Wittemann-Lewis Model C plane last week, piloted by Lieut. S. A. Morgan, former Army instructor, flying from Newark to Asbury in 29 minutes.

The trip was arranged by L. S. Plaut & Co., of Newark, who makes regular deliveries of their dry goods merchandise by airplane. Julius S. Meirick is director of flying at the Plaut plant.

Flights are now being arranged for a number of other prominent New Jersey officials.

Planes for Visitors

An indication of the times is furnished by the Central Committee of the Knights Templar Conclave to be held in Philadelphia the week of September 8, in that arrangements had been made with the Philadelphia Aero-Service Corp. to provide hangar space and flying accommodations for the Knights who come to the conclave by airplane. A map showing the air route accompanied the announcement. Provisions have also been made for a continuous free automobile service from the flying field to the center of the city.

The Philadelphia Aero-Service Corp. have a fully equipped flying field in the suburbs of Philadelphia.

Louis G. Groh, 2218 Vine Street, is chairman of the committee to whom correspondence may be addressed or details may be had from the Philadelphia Aero-Service Corp., 1209 Arch Street, Philadelphia.

Kronstadt Bombarded

Eight British airplanes arose from cruisers stationed in the Baltic Sea and bombed Kronstadt, Bolshevik naval base, for forty minutes Aug. 1. Bolshevik batteries replied. The airplanes returned safely, according to information received at Helsingfors.

Independent Air Force

(*Continued from page 3*)

(c) From the enlisted personnel of the Air Force.

(d) From civil life.

(e) Experts in various lines of technical work, who shall be commissioned on a staff basis only.

Enlisted men of the Air Force shall be recruited in a manner similar to that in effect in the Army or Navy, or as may be prescribed by the President. The civilian personnel employed in the Department of Aeronautics shall be of two classes: (a) Personnel subject to civil-service laws, wherever same apply; (b) personnel of certain selected technical qualifications, to be employed at the discretion of the Director of Aeronautics without reference to the civil-service laws.

For the purpose of training, education, and coordination of departmental functions, officers, enlisted men, and civilian personnel of the Departments of War, Navy, and other departments of the Government may be temporarily detailed from time to time to the Department of Aeronautics, under such regulations as shall be agreed upon by the Director of Aeronautics and the head of the other governmental departments concerned. Reciprocal arrangements are hereby authorized to be made for the temporary detail of officers, enlisted men, and civilian personnel, for purposes similar to the above mentioned, from the Department of Aeronautics to the other departments of the Government.

For the purpose of securing a reserve of officers and enlisted men for the Air Force, there is hereby established in the Department of Aeronautics an Air Force Reserve, to be organized into such reserve corps, forces, and other organizations as may be prescribed by the President, and said aeronautical reserve, until such time as further legislation is enacted by Congress, shall be governed by all existing laws not inconsistent with this Act governing reserve organizations of the Army. All officers and enlisted men in any reserve, reserve corps, or other reserve organizations of the Departments of War and Navy pertaining to aeronautics shall be, and hereby are, transferred to the reserve of the Department of Aeronautics, with equivalent rank, grade, ratings, and privileges, and shall be governed, until otherwise prescribed by the President, by all prevailing laws regarding the reserve of the department from which such officers and enlisted men are transferred.

Subject to the approval of the Director of Aeronautics, the enlisted personnel serving in corps, offices, bureaus, divisions, sections, and branches of the Government pertaining to aeronautics now and heretofore under the War Department and the Navy Department and in this Act transferred to the Department of Aeronautics, shall be, and hereby are, transferred to the Air Force with grade, pay, ratings, and allowances equivalent to those now held and received by them. The commissioned personnel serving in corps, offices, bureaus, divisions, sections, and branches of the Government pertaining to aeronautics now and heretofore under the War Department and the Navy Department and in this Act transferred to the Department of Aeronautics, may, at the discretion of the President, be transferred to the Air Force and permanently commissioned therein with rank, pay, ratings, and allowances equivalent to those now held and received by them: *Provided, however,* That no officer shall be so transferred without his consent; *And provided,* That officers transferred from the Navy to the Air Force shall be commissioned therein and take rank with officers transferred from the Army to the Air Force according to length of commissioned service; *And provided,* That all laws now in effect pertaining to the rating of flying officers and enlisted men of the Army shall remain in full force and effect and shall apply to all flying officers of the United States Air Force, except as herein especially provided, and all authority to rate flying officers now delegated by law to officers of the Naval or Military Establishments or any branch or service thereof is hereby transferred and vested in the Director of Aeronautics: *And provided further,* That former officers of the aeronautical branches of the Army and Navy who served creditably in the war against Germany may be commissioned in the Air Force upon the basis of their record of qualifications and service, without further technical examination at any time within one year from the date of passage of this Act.

The officer personnel of the Air Force shall be commissioned in the following grades: Major general, brigadier general, colonel, lieutenant colonel, major, captain, first lieutenant, and second lieutenant. In the initial organization of the Air Force, the number in the various grades below the rank of general officer shall not exceed the following percentages of the total authorized strength of the Air Force, namely, colonels, 3 per centum; lieutenant colonels, 3 per centum; majors, 9 per centum; captains, 15 per centum; first lieutenants, 30 per centum; second lieutenants, 40 per centum: *Provided further,* That no officer shall exercise command over aeronautical flying units except a flying officer, namely, a regular qualified pilot or observer, and that the commanding officer or military head of the Air Force shall be a flying officer.

During a flying officer's service if at any time he is detailed to a command which carries a higher grade in the current tables of organization, he shall be entitled to said higher grade during his tenure of the command, and should he be retired while holding such command, he shall be entitled to retirement as of that grade: *And provided further,* That a flight within a squadron shall be commanded by a captain, a squadron or balloon company shall be commanded by a major, a group of two or more squadrons or balloon companies shall be commanded by a lieutenant colonel, a wing of two or more groups shall be commanded by a colonel, a brigade of two or more wings shall be commanded by a brigadier general, a division of two or more brigades shall be commanded by a major general: *Provided,* That the President may fix the rank to be held by commanders and officers of lighter-than-air units: *And provided further,* That flying officers in the Air Force, unless sooner promoted to fill existing vacancies, shall be eligible for promotion upon the following basis: After three years' service to be promoted to first lieutenant, after five years, service to be promoted to captain, after twelve years' service to be promoted to major, after twenty years' service to be promoted to lieutenant colonel, after thirty years' service to be promoted to colonel. Upon completion of thirty years' service, or at any time, if on account of physical disability, a flying officer shall be entitled to retirement with 76 per centum of the pay drawn by him at date of retirement. Should a flying office retire at any time during his period of service of thirty years, except for physical disability, he shall be entitled to retired pay proportioned to the following graduated retirement pay scale: Twenty-five per centum retired pay for ten years' service; 50 per centum retired pay for twenty years' service; 75 per centum retired pay for thirty years' service. The retired pay after ten years' service shall be computed in proportion to the time served: *And provided further,* That nonflying officers shall be entitled to all the rights and privileges of flying officers except authority to exercise command over aeronautical flying units.

The grade of master aviation mechanic is hereby created in the Department of Aeronautics. The pay, allowances, and rank of a master aviation mechanic shall be equivalent to the pay, allowances, and rank of a master signal electrician in the Signal Corps of the Army. The enlisted strength of the Air Force, exclusive of auxiliary troops, shall consist of master aviation mechanic, first sergeants, sergeants (first class), sergeants, chauffeurs (first class), chauffeurs, corporals, cooks, privates (first class), and privates, the number in each grade being fixed from time to time by the President. The numbers in the various grades shall not exceed the following percentages of the total authorized enlisted strength of the Air Force, namely, master aviation mechanics, 2 per centum; first sergeants, 2 per centum; sergeants (first class), 7 per centum; sergeants, 10 per centum; chauffeurs (first class), 4 per centum; chauffeurs, 8 per centum; corporals, 20 per centum. The number of privates (first class) shall not exceed 25 per centum of the number of privates: *Provided,* That the ratings of aviation mechanic and balloon mechanic, as now authorized by law for the Army, and with such additional compensation as, in the discretion of the President, shall be deemed necessary from time to time, are hereby authorized for enlisted men of the Air Force, and the Director of Aeronautics is authorized from time to time to cause such number of enlisted men as he may deem necessary to be so rated.

The total commissioned and enlisted strength of the auxiliary troops of the Air Force, which number shall not be included in the effective strength of the Air Force, and the number in each rank and grade shall be limited and fixed from time to time by the President in accordance with the needs of the Air Force. This strength shall consist of like ranks and grades, and like numbers in each rank and grade, to those now authorized in similar corps and departments of the Army: *And provided further,* That for the purpose of efficient organization at the outset of operations of the Air Forces, and subject to the approval of the Director of Aeronautics, all officers and enlisted men of the Department of War and the Department of the Navy now serving in staff corps, departments, and bureaus and attached as auxiliary troops to aeronautical headquarters, staffs, tactical units, or other aeronautical organizations within the War or Navy Departments shall be, and hereby are, transferred to the Air Force to be assigned to corresponding staff corps, departments, and bureaus of the Air Force with equivalent rank, grade, pay, and allowances to those previously held and received in their former departments: *Provided, however,* That no officer shall be so transferred without his consent.

Sec. 6. That all corps, offices, bureaus, divisions, sections, branches, and units of the War and Navy Departments, with all records, papers, furniture, buildings, materials, machinery, apparatus, vehicles, vessels, and material pertaining thereto which have heretofore operated for the purpose of defense against aircraft, including all antiaircraft artillery, antiaircraft machine guns, searchlights, and other appurtenances, are hereby transferred to the Department of Aeronautics.

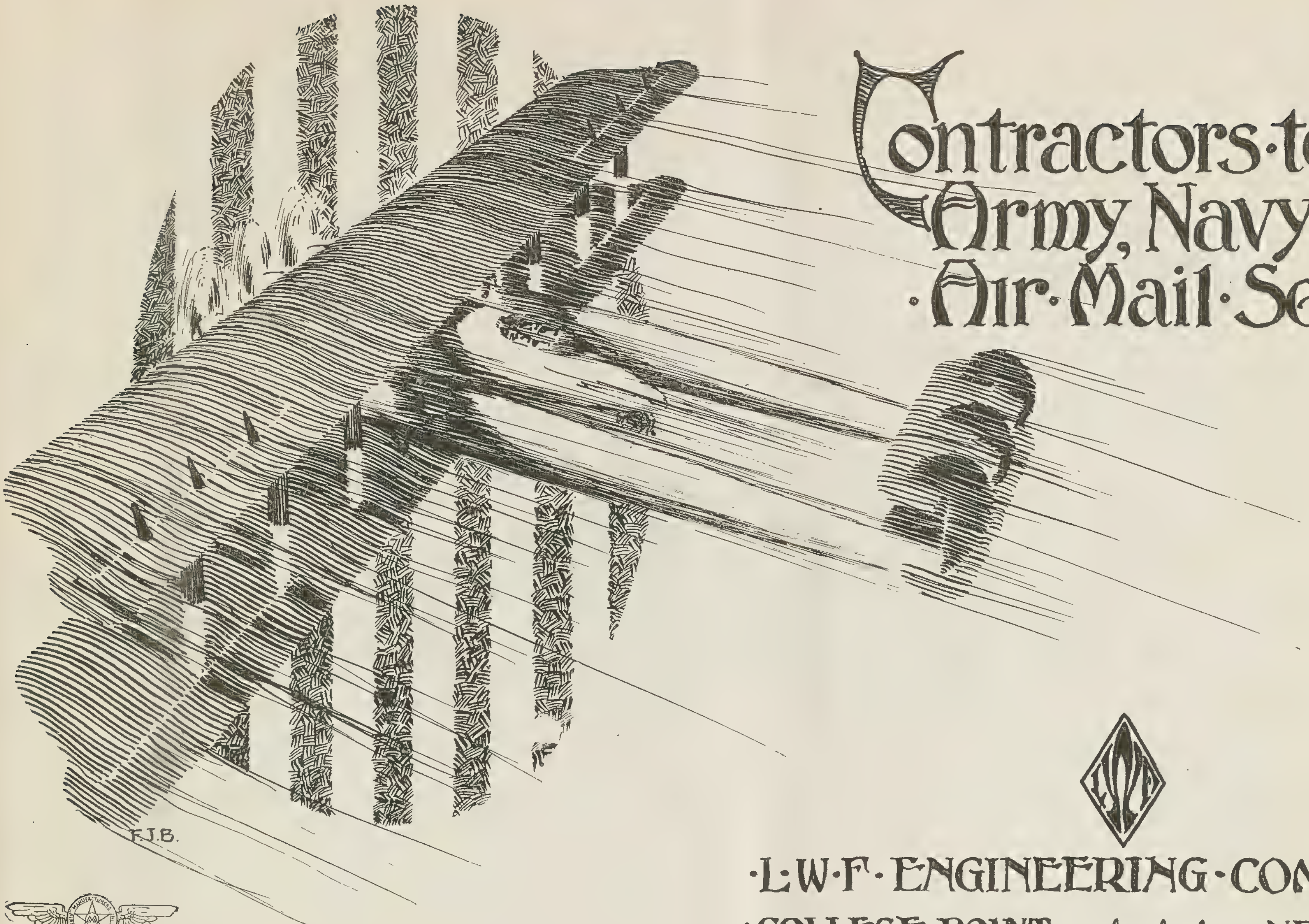
And each and every function, authority, power, duty, and jurisdiction, of whatsoever character it may be, vested at the time of any transfer aforesaid in the head of the executive department from which such corps, office, bureau, division, section, or branch is transferred, shall to the extent to which such function, authority, power, duty, or jurisdiction pertains to such corps, office, bureau, division, section, or branch of the Government, immediately upon such transfers, become vested and hereafter remain vested in the Director of Aeronautics.

All land, buildings, furniture, apparatus, equipment, and property, of whatsoever description, and all official records and papers in the custody of any executive department from which any corps, office, bureau, division, or other branch of the Government is transferred as aforesaid and pertaining to the business of such transferred corps, office, bureau, division, or other branch of the Government shall at the time of such transfer, or as soon thereafter as practicable, and in so far as such action can be taken without hindering the work of the executive department from which such transfer is made, be given over into the custody of the Department of Aeronautics. And all unexpended balances of appropriations available at the time of such transfer for the use of any such transferred corps, office, bureau, division, or other branch of the Government, or which may become available thereafter, shall be and remain available in similar manner and to the same extent as if no transfer had been made: *Provided further,* That for the purpose of efficient organization, maintenance, and operations of all defenses against aircraft and subject to the approval of the Director of Aeronautics, all officers, enlisted men, and civilian employees now serving in any of the above-mentioned corps, offices, bureaus, divisions, sections, branches, and units which have heretofore operated for the purpose of defense against aircraft shall be, and hereby are, transferred to the Air Force with equivalent rank, grade, pay, and allowances to those previously held and received in their former department: *Provided, however,* That no officer shall be so transferred without his consent.

Sec. 7. That the administration of the Department of Aeronautics and the Air Force thereof shall be governed by existing laws and regulations governing the War Department and the Army in so far as they are applicable to said department and force as created and organized by this Act, until such time as other laws are enacted and until other regulations are prescribed by competent authority; and the commissioned officers and enlisted men of the Air Force of said department shall have, respectively, the tenure of office, status, rights, and privileges that are now or shall hereafter be authorized by law for commissioned officers and enlisted men of similar grades in the Army.

Sec. 8. That the Director of Aeronautics shall annually, at the close of each fiscal year, make a report in writing to Congress, giving an account of all moneys received and disbursed by him and his department and describing the work done by the department. He shall also, from time to time, make such special investigations and reports as may be required by the President or by Congress, or which he himself may deem necessary.

Sec. 9. That this Act shall take effect from and after the date of its passage, and all Acts or parts of Acts contrary to the provisions of this Act or inconsistent therewith be, and the same are hereby, repealed.



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Handicap Air Race

A competitive air race which, it is said, for the first time in the history of aviation, is to be a handicap affair, will take place between New York and Toronto during the last week of this month, the American Flying Club has announced.

Planes of various approved types, weights, and speeds will compete on an equal footing, the faster machines being handicapped by the Contest Committee according to a formula. The contest is for the Hotel Commodore prize of $10,000 or its equivalent, and the American Flying Club, the Canadian National Exhibition, and the Aero Club of Canada trophies.

The Prince of Wales, who will be at Toronto at the time, will start the race from the Canadian field, and General William Mitchell of the U. S. Air Service will send the machines northward from New York. The starting point here, it was said, will probably be the Government flying fields on Long Island. The Canadian entries will start from the grounds of the Canadian National Exhibition. Captain James Beaty, President of the Aero Club of Canada, has charge of arrangements at that end.

The total distance of the round-trip course is 1,076 miles, divided as follows: New York to Albany, 142 miles; Albany to Syracuse, 147 miles; Syracuse to Buffalo, 140 miles, and Buffalo to Toronto, 100 miles.

"The Contest Committee of the American Flying Club, which is to have exclusive jurisdiction over the contests, reserves the right to reject any entry," the announcement says. "This is done to make certain that no ship with a low safety factor, or even one which is not mechanically right in every respect, can start. No ship will be allowed to leave any of the obligatory landing stations if the representative does not believe the condition of the machine good enough to permit its safe flight to the next station.

"The time limit spent at the authorized control stations, which will be provided with fuel and spare parts, will not count against the pilot's time. Any forced landing en route at any point save the three controls, will be included in the total flying time. The race will start Aug. 25, and must be completed by Aug. 29 if the pilot is to qualify for the prizes."

No Trespassing!

That the "No Trespassing" sign may even sound its warning against the airplane has come to light in Iowa, where last month in arranging for a landing field in connection with Chautauqua flights, G. F. Scales, president of the Miller-Scales Aero Co., of Waterloo, Iowa, came upon this:

Notice to the Man Higher Up

Keep Off This
Farm With Airoplain
No Trespassing Allowed

The owner of the farm did not have damage suits in his mind, either, for in attempting to settle with him for a landing, the farmer insisted that he had all the money he needed, and that his livestock did not care to mingle with aircraft they were not accustomed to. How the farmer expected a pilot to see the sign from the air was not explained.

That this question will come up again can hardly be doubted, for court action has already been brought which will determine whether a property owner is also owner of the air above his land. Frederick Hoenemann, a farmer near Kansas City, Mo., is seeking to restrain an airplane company from using the air above his farm.

There is said to be no direct precedent to guide the court, and the case is causing considerable discussion in legal circles. Legal experts of England have discussed the matter from the standpoint of national ownership of the air, it is said.

Some lawyers contend that freedom of the seas and freedom of the air are the same, while others assert the courts have held that ownership carries with it light and air above the property as well as the earth beneath.

It is pointed out that when the steam engine came there were many lawsuits, the plaintiffs contending that the noise as well as the danger jeopardized their stock. The Massachusetts Supreme Court, however, rendered the opinion that the locomotive was lawful and in keeping with progress. Attorneys say a similar condition arose when motor cars came into use, but the highest court of Indiana ruled in their favor on the grounds that the law must keep pace with progress.

Woman Flies From Albany

To Miss E. Wilma Bacon, office manager of the Albany Chamber of Commerce, has been accorded the honor of being the first woman to make a nonstop airplane flight from Albany to New York. She left the Albany Chamber of Commerce Aviation Field at 5:20 on the afternoon of Aug. 1 in a 450-hp. Government machine, piloted by Lieut. Robert Midkiff, and landed at Hazelhurst Field, Mineola, two hours and five minutes later.

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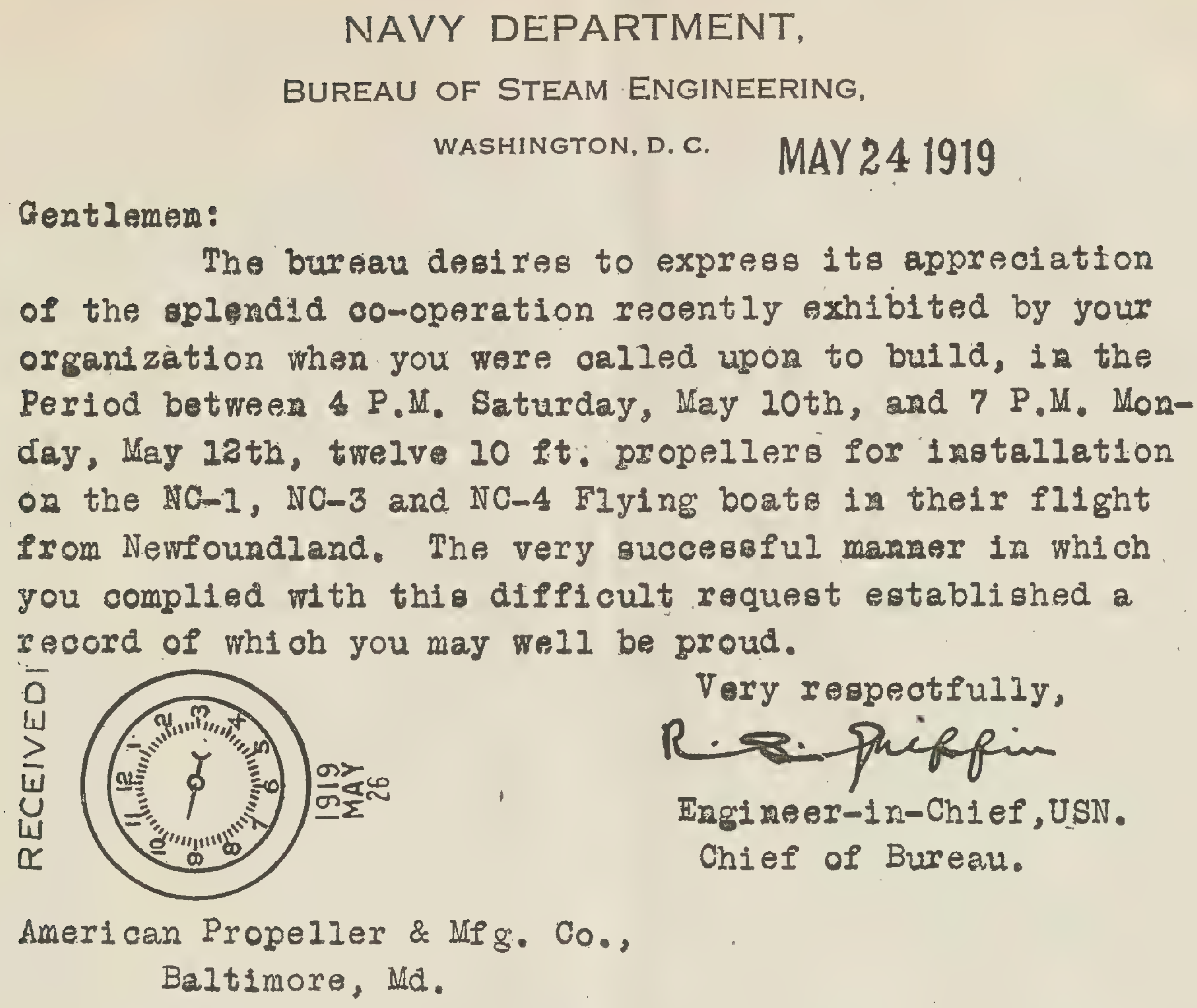

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BUREAU OF STEAM ENGINEERING,

WASHINGTON, D. C. MAY 24 1919

Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

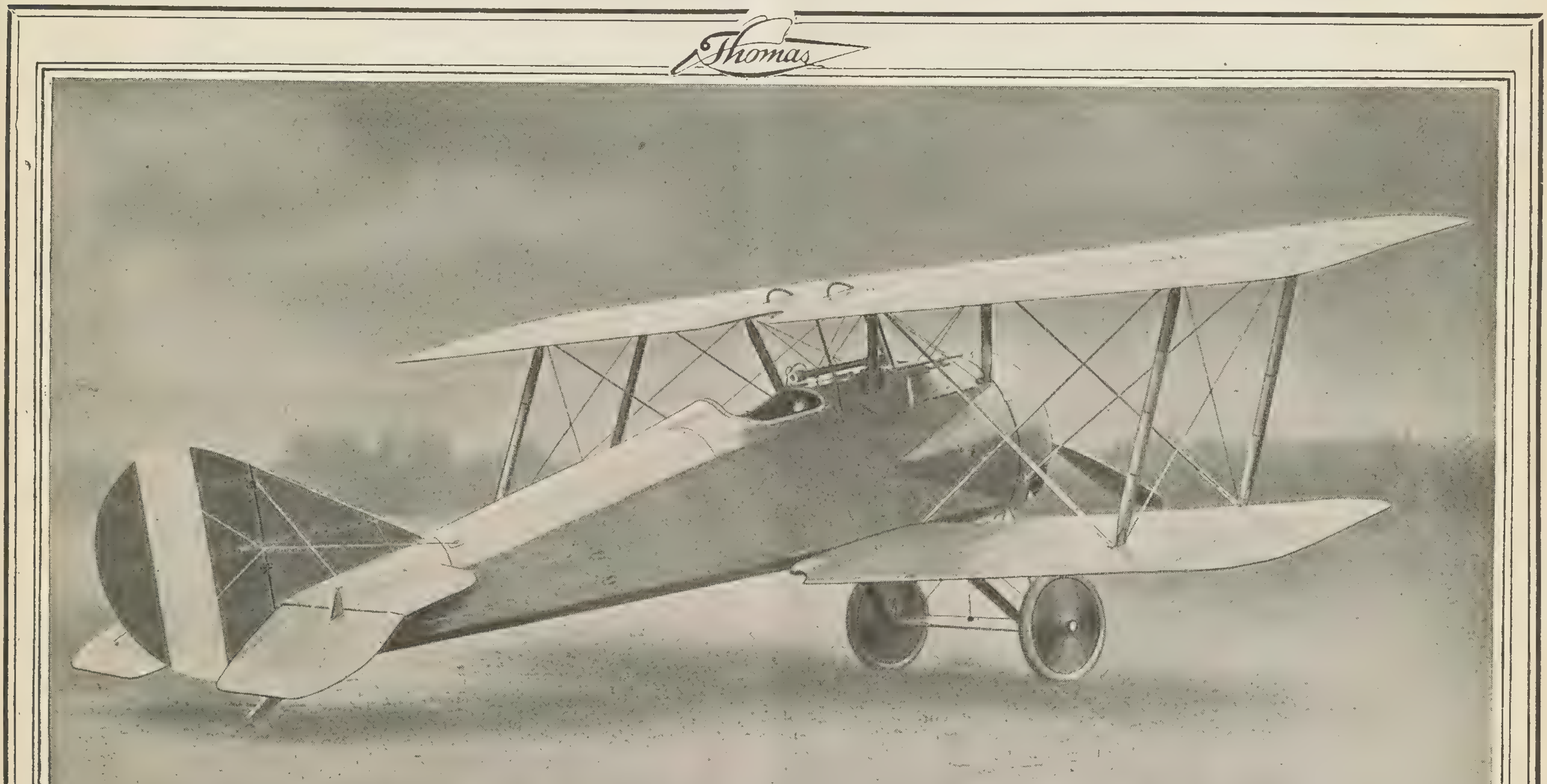
RECEIVED 1919 MAY 26

Very respectfully,

R. S. Griffin

Engineer-in-Chief, USN.
Chief of Bureau.

American Propeller & Mfg. Co.,
Baltimore, Md.



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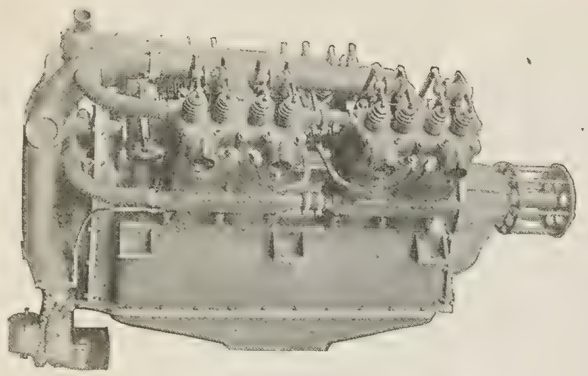

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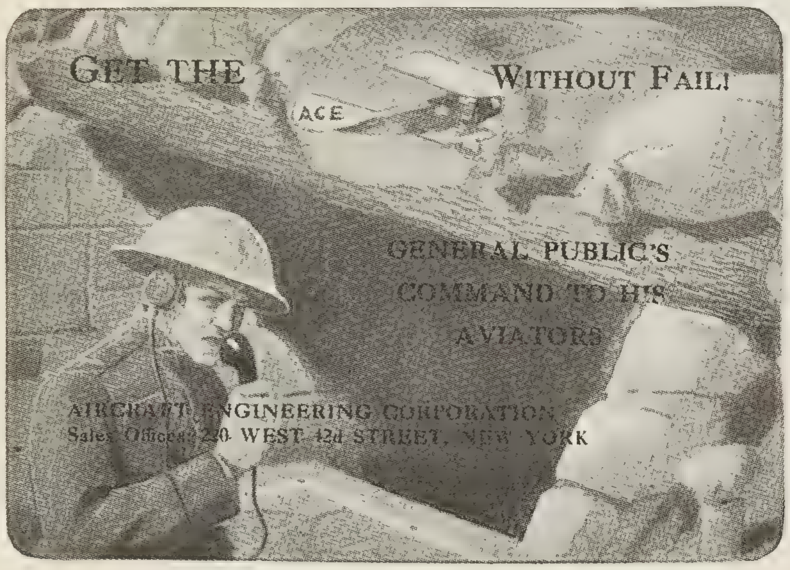
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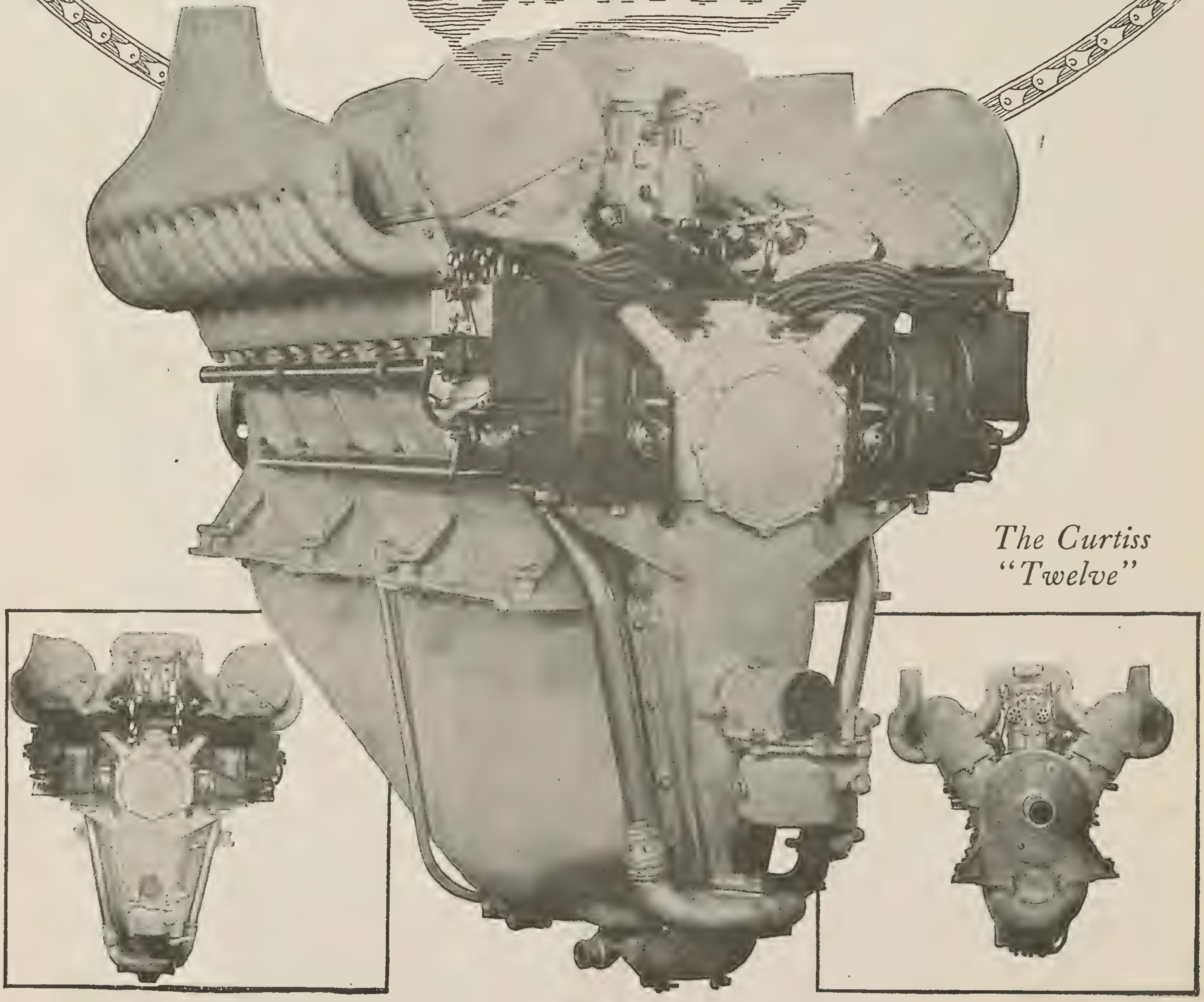

The Curtiss "Twelve"

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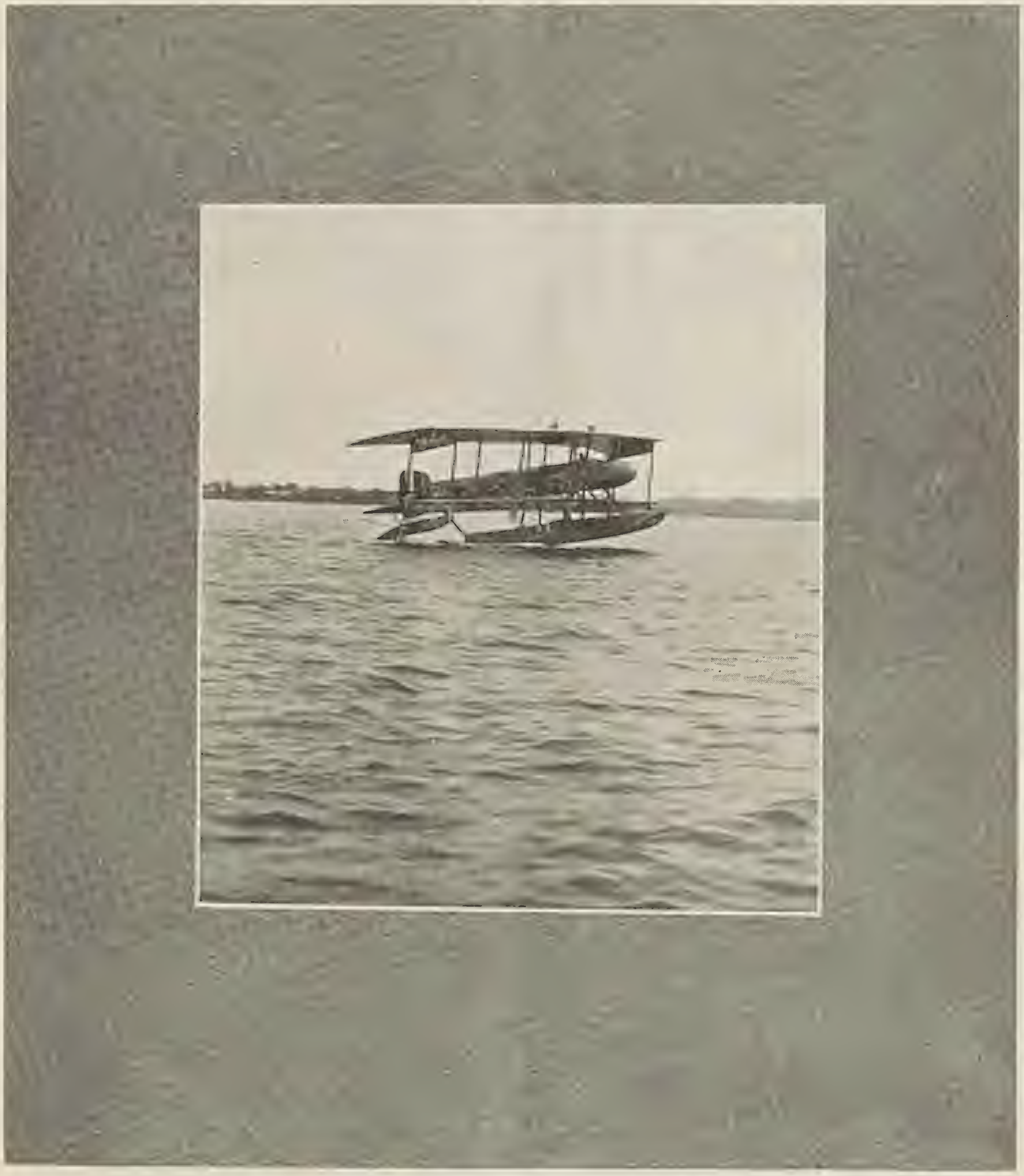
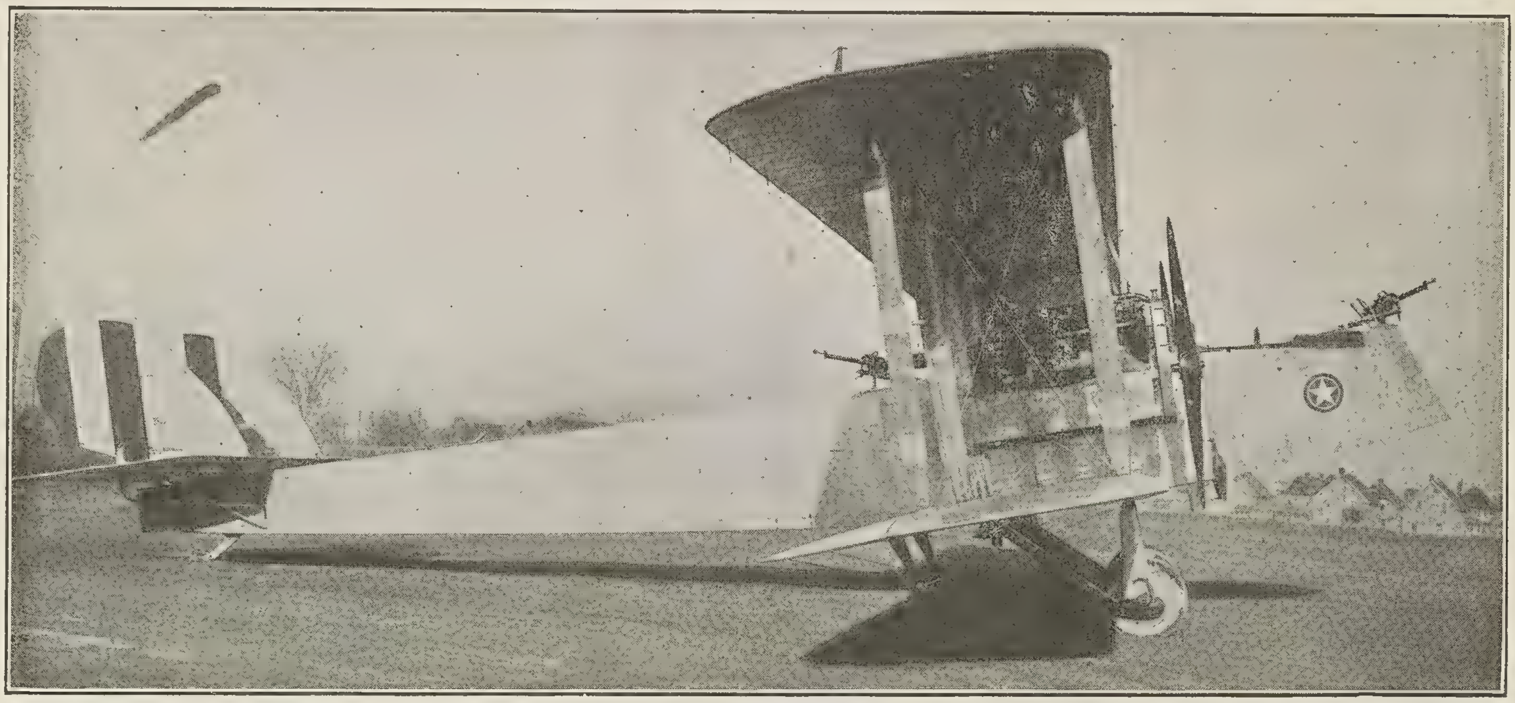


Gallaudet D-4 Landing



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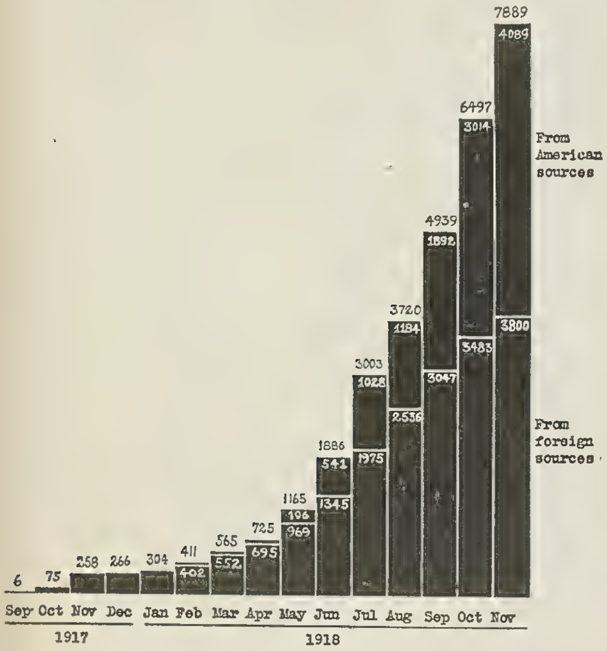
Colonel Patrick Testifies to Congressional Sub-Committee Investigating Air Service

The Congressional sub-committee investigating the activities of the Air Service during the war is developing an amount of information which it is hoped will be sifted to the bottom before conclusions are made.

Colonel M. M. Patrick, who was Chief of the Air Service A. E. F. as a Major-General, appeared before the committee and gave facts and figures in a way that they have not been presented before.

Colonel Patrick submitted figures showing that France, with 1,500,000 men actually on the front, had 3,321 planes of all descriptions in operation; that England, with 900,000 men at the front, had 1,758 planes, and that the United States, with 1,250,000 men at the front, had just 740 planes in operation. To have been adequately protected, Colonel Patrick testified, the American forces should have had 3,400 serviceable planes.



Production of Service Planes

At the time of the armistice the Allies were easily superior in the air with 6,784 planes, as against 3,352 enemy machines. Heretofore the statement has often been made that the Germans were superior in the air. Colonel Patrick said that the figures which he produced were obtained by Allied secret service men and were published in Paris in the *Aerial Bulletin*. The officer declared he considered the figures absolutely accurate.

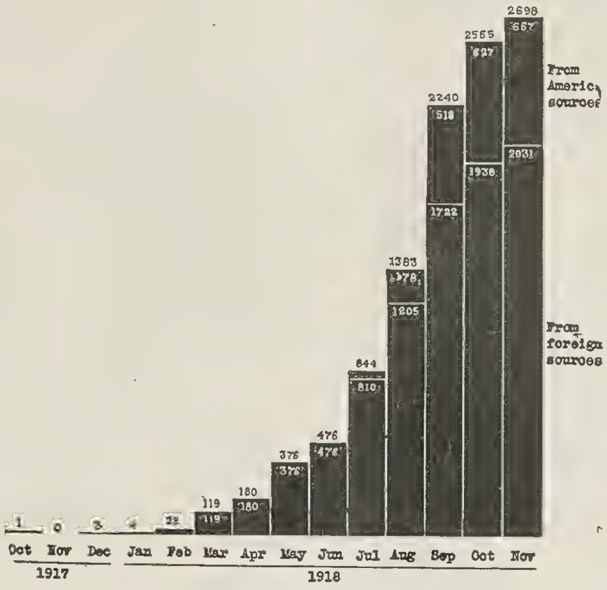
The burning of airplanes in France, which has been under investigation by another Congressional sub-committee, was entirely justified, Colonel Patrick testified. He said the planes were stripped of their motors and metal parts, and were destroyed only because they were useless, and it would have been a poor investment to ship them back to the United States. There was no secrecy about the matter, he declared, and he asserted that no Liberty motor fit to fly, and no propeller fit to use, was destroyed.

To bring each damaged plane back to the United States, he said, $400 would have been required for boxing and other expense, in addition to transportation cost and the expense in tonnage.

Colonel Patrick testified that when the armistice was signed he had 744 pilots, 457 observers, and 23 aerial gunners, all completely trained, making 1,234 fliers; that the total number of officers in the Air Service was 7,726, with 70,769 men, of whom about 20,000 were being trained in England.

Colonel Patrick gave it as his opinion that there should be provided 2,720 planes of all kinds for each 1,000,000 men at the front, and that there should be about eighty men for each plane, including, of course, the ground men.

The table submitted by Colonel Patrick showed the strength of the various armies on July 30, 1918, and again at the time of the armistice. This table follows:



Service Planes Sent to Zone of Advance

July 30—	Bomb'g Total.	July 30—	Bomb'g Total.
France	2,820	Germany	2,592
England	1,638	Austria	717
America	270		
Belgium	160		
Italy	640		

Total Allied airplanes, 5,488; total enemy airplanes, 3,309.

Nov. 11—	Bomb'g Total.	Nov. 11—	Bomb'g Total.
France	3,321	Germany	2,730
England	1,758	Austria	622
America	740		
Belgium	153		
Italy	812		

Total Allied airplanes, 6,784; total enemy airplanes, 3,352.

The planes, said Colonel Patrick, were distributed along the western front, but did not include other planes used by the Allies and Germany along other fronts and for the protection of cities. The officer gave the total American aviation personnel abroad as 7,726 officers, flying and nonflying, and 70,769 men. Of these, 686 officers and 51,229 men were in France, the others for the most part being in training in England. This was on Nov. 11. Prior to that date the number was smaller, but the exact figures were not given.

General March, Chief of Staff, continuing his testimony early last week before the Senate Committee on Military Affairs, declared that under the War Department's plans substantially the same proportion between the personnel of the Air Service and the peace army would be maintained as it was at the time of the signing of the armistice.

"While recognizing the great field of work which lies ahead of the air service and admitting its urgent needs for proper development," said the General, "the War Plans Division does not believe that special consideration should be accorded to an air service in making a reapportionment."

To make such a reapportionment, declared General March in his testimony would involve cutting down the appropriation of other arms of the service.

New Record Claimed

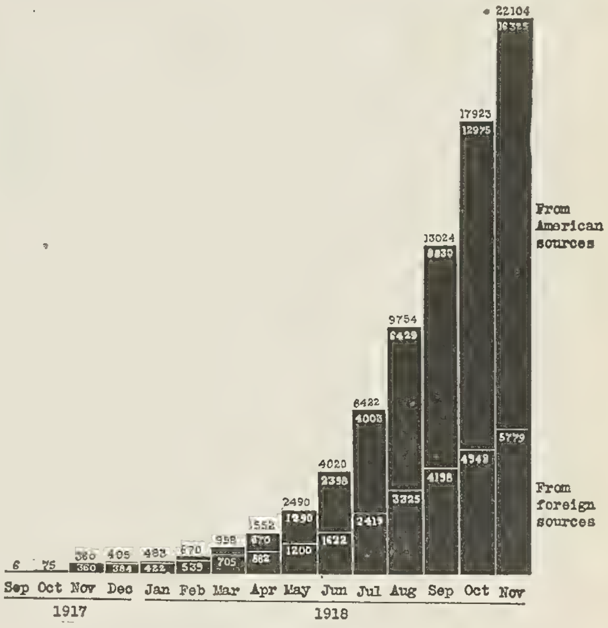
Maurice Walbaug, flying with one passenger, claimed to have established a world's record today by reaching an altitude of 7,800 meters (25,590 feet).

Lieut. B. Papa of Italy, carrying a passenger, was credited in December, 1917, with an unofficial altitude record of 23,212 feet.

Amsterdam Exposition

The first aviation exhibition in Amsterdam, which was opened on Aug. 1, is attracting great interest and bringing tremendous crowds.

The exhibition has shown, however, that there are few places in Holland suitable for landing large machines, owing to low-lying grounds. The exhibition grounds are no exception to the rule, and practically all the large machines have sunk deep into mud on landing.



Production of Service Engines

Zeppelin for U. S.?

The Allied commission which will take over the German Zeppelins and seaplanes was to meet in Cologne Aug. 10. The United States was to be represented by Navy and perhaps also by Army officers.

It is expected that the organization of a commission will take some time. When the peace treaty has been ratified by three great powers the commission will then proceed into Germany to conclude arrangements for the transfer of aircraft, according to the provisions of the peace terms. The question of allotment will be decided after a full survey is made.

White House to N. Y.

From the White House to Brooklyn Bridge, New York, in 127 minutes is the record of Lieut. F. J. Plumb, pilot, and Capt. W. H. Chandler, observer, in a DeH-4. The 220 miles were made against a strong head wind flying at an altitude of 3200 ft.

Captain Chandler and Lieutenant Plumb are members of the Dallas-Boston Flying Corps of seven DeHavilands.

Aviators' Club of Pennsylvania Plans for the Future

Model Civic Airdrome, Federal Air Department, and Flights for All Are Aims of New Organization

A $1,000,000 civic airdrome, to be a model for every large city in America, support of a federal aviation department headed by a cabinet officer, and a chance for every flier to take the air when the mood seizes him are the foundations of the Aviators' Club of Pennsylvania, recently organized by the former service fliers of Philadelphia and vicinity.

Already steps have been taken which assure the construction of a monster airdrome and country clubhouse early next spring; a resolution has been prepared and forwarded to President Wilson and both houses of Congress, urging the immediate formation of an Air Department, headed by a cabinet officer and Pennsylvania aviators who so desire can get either land or sea planes at the two stations the club has arranged to use whenever they desire.

Activity is the slogan of the new club, composed and directed exclusively by active fliers. That the organization will shortly rank with the leading aerial clubs of the country is assured not only through the activities of its members but also through the offer of the Aero Club of Pennsylvania, the second oldest and largest aero club in America, through Joseph A. Steinmetz, president of that organization to turn that club in its entirety—funds, membership, club rooms and books—over to the Aviators' Club, to be done with as they see fit. Although this union has not been completed details of the combine are being arranged by committees of both organizations. When this combination is completed the club will be the peer of any of its kind in the United States.

The active officers elected, all of whom are fliers, are: Captain Claude R. Collins, New York City Air Police, president; George S. Ireland, agent Curtiss Eastern Airplane Co. and Brooke Edwards, former army flier, vice-presidents; Charles W. Carvin, night flying instructor, secretary; Floyd Showalter, manager Essington School of Aviation, treasurer. Directors: John Bell Huhn, Murray Earle, George R. Brown, D. Willard Zahn and Sewall Cathcart. Mr. Richard J. Beamish, aircraft production expert, was made an honorary life member.

The club will be divided into two classes, fliers and non-fliers. Only fliers will be entitled to vote. Temporary club rooms are located in the Aero Club of Pennsylavnia headquarters in the Engineers' Club, one of the finest clubhouses in Philadelphia, of which Mr. Steinmetz is president.

"The civic airdrome idea," Captain Collins, president of the new fliers' club stated to AIRCRAFT JOURNAL, "is one of the most important now facing the United States in advancing aviation. In and around Philadelphia there are at present almost a score of active aerial enterprises, all of which have leased or bought practically every available vacant piece of land for an airdrome. Many of these are inadequate, in undesirable locations or too rough for good fields, and highly inflated prices have been paid for them. All of these points are serious drawbacks to the development of the air game.

"The idea of the members of the Aviators' Club of Pennsylvania is to attempt to obtain from the city, through legislation, a piece of land about a mile square, on the banks of the Delaware River, as near the City Hall as possible, to be used as an airdrome and country clubhouse site. Space around the edges of the field will be cleared, hangars built and leased to commercial enterprises at prices placed as low as possible. An aerial garage, machine shop, dope shop, service station and supply store will be conducted in conjuction, with skilled mechanics always at hand. The club house will be placed at the disposal of the firms using the facilities of the field, and no interference with any enterprise will be offered by the club. This will furnish commercial enterprises, with the best possible landing field at a low cost; mechanic and repair service; supplies without waiting; a place to bring their patrons and the opportunity to extend their businesses in every possible way. Every firm approached has heartily approved the idea and offered complete coöperation."

Weather Forecasts

Weather forecasts for aviators and balloon pilots, to be announced twice daily, at 9:30 a.m. and 9:30 p.m., and to cover a period of 24 hours are prepared by the Weather Bureau of the U. S. Department of Agriculture. The map of the United States has been divided into thirteen zones for the purpose. The first forecast was issued Aug. 10.

The Air Service has sent out the map to active stations throughout the country and the forecast will be forwarded at the time made, it being intended that all cross-country fliers shall be advised of weather conditions before starting on any contemplated flight, thereby reducing, as much as possible, the liability of injury to aviators, balloon pilots, passengers and property as far as the weather conditions are concerned.

The forecasts have been in operation with the country divided into seven test zones since July 21, with very satisfactory results. This has brought about the increase in the number of zones to thirteen and general adoption of the plan.

International Trophy

The Jacques Schneider international trophy, last won by C. Howard Pixton in a Sopwith baby seaplane at Monte Carlo in 1914, will be competed for on Wednesday, Sept. 10, at Bournemouth. The water course will be over a circuit of about thirty miles, starting from Bournemouth and taking in Swanage and Christchurch. The distance this year will be 200 nautical miles instead of 150 as in 1914.

Again Crosses Andes

Lieutenant Locatelli, an Italian aviator, who had just flown from Buenos Aires to Valparaiso, made a non-stop flight from Santiago, Chile, to Buenos Aires, Aug. 5. The time of the flight was 7 hours and 10 minutes. The air voyage completed the aviator's round trip from the Atlantic to the Pacific and over the Andes Mountains.

Several aviators belonging to the Italian aviation mission which is visiting Argentina went out in airplanes to meet Locatelli and escorted him into Buenos Aires.

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Alcohol as Fuel

The Post Office Department has made a number of tests under adverse conditions with a new alcohol fuel designed to replace high grade gasoline with marked success, and it is announced that the Department will shortly be operating the entire New York-Washington route with the alcohol fuel.

The great advantage of the new fuel lies in the cleanliness of the motor, reducing cost of upkeep, and in its burning cooler than gasoline, thereby overcoming objections to the high compression motor at low altitudes. The planes which ordinarily use 25 to 26 gallons of gasoline operate on the new fuel on about 20 gallons, which gives greater flying radius to the planes. It reduces chances of forced landings by keeping the spark plugs and the engine cylinders clean of carbon and oil accumulations. With this fuel it will be possible to operate the mail in a De Haviland-4 regularly in a non-stop flight from New York to Cleveland, a distance of 430 miles, whenever fog or rain conditions in the mountains make it inadvisable to attempt to land at the intermediate field at Bellefonte, Pennsylvania.

Great Britain to Brazil

The first passenger airship from Great Britain to Brazil is scheduled to leave Barrow-in-Furness to Rio de Janeiro some time this month. Twenty passengers and a small cargo will be carried aboard the vessel, which will be fitted out with all the luxury and comfort of an ocean liner.

The airship will fly by way of Lisbon, Sierra Leone, and thence to Rio. The anticipated flight will take about four days each way, and if successful will be the prelude to a regular service, which will be maintained by Vickers.

Sir Woodman Burbidge, according to report, has booked three berths for himself, his wife and a friend for the round journey to Rio and back. The price of the tickets was £1000 apiece.

The R-80, as the airship that is supposed to make the trip is now known, has been under construction at the Vickers Barrow works for some months. She was ordered by the Admiralty last year, with the object of producing a rigid British airship of medium dimension which would give the same performance as the latest German Zeppelin.

She has a capacity of 1,250,000 cu. ft., or rather more than half the size of the R-34. She has a cruising speed of forty-six miles and a full-power speed of sixty miles an hour, and is 535 ft. in length.

The passengers' living quarters are on the top of the hull, where are situated a large saloon fitted out like a Pullman car, a roof garden, and a shelter deck, and cabins of sleeping berths.

Start of the R-33

The British airship, R-33, is to start on her flight to India this week, according to a London announcement.

The R-33 is a sister ship of the R-34, which made the voyage to the United States and return.

Madrid to Rome

Aviator Stoppani, piloting an airplane from Madrid to Rome, made the flight without stop in 11 hours, 45 minutes, Aug. 6, by way of the Gulf of Lyons, Marseilles, Spezia and Pisa.

The aviator carried a letter from King Alfonso of Spain to King Victor Emmanuel of Italy.

Tour of the "All American Pathfinders"

Major Baldinger's Squadron Determined on Success Even in Face of Entwined Black Cats and Thirteens

The "All-American Pathfinders," a squadron of thirteen Army airplanes, accompanied by a Motor Transport train, were scheduled to leave Hazelhurst Field, Long Island, Aug. 13, on the beginning of a tour of more than 4,000 air miles through fifteen States. On its route the squadron will collect data for the Army Air Service, for the Air Mail Division of the Post Office Department, and recruit men for all branches of the service.

Standing, Left to Right—Lieut. R. W. Grower, Lieut. M. F. DeRosier, Lieut. C. C. Shangraw, Lieut. W. N. Dudley, Major M. L. King, Capt. F. B. Weiners, Lieut. O. O. Neirgarth, Lieut. P. D. Riblet; Seated—Lieut. L. M. Wightman, Capt. John Howry, Capt. J. D. Jones, Capt. H. J. Vogel, Col. Archie Miller, Lieut. J. E. Adams, Lieut. Geo. McDonald, Lieut. B. J. Tooher, Lieut. L. E. Cook.

N. Y. H. Service

The tour will demonstrate how an air squadron can maintain itself by means of an automobile train far from any fixed base. The unit will be under the command of Major Ora M. Baldinger.

To show that the efficiency of the Air Service in this country will overcome almost any difficulty, the commanding officers of the "Pathfinders" decided last week to take thirteen planes instead of nine and to make the official start of their tour on the thirteenth of the month. In an effort to show additional defiance of hoodoos and superstitions the pilots obtained permission from the War Department to paint on the fuselage of every machine a gigantic black cat, with the tail of the beast tied up into the figure "13."

For the last two weeks the airplanes of the squadron have been carrying on practice flights between Pittsburgh and the Long Island fields, and the pilots have completed their aerial mapping and photography between the two points. The motor truck train will leave the field early in the week, so that the entire unit may be able to go into its first demonstration camp at Columbus, Ohio, on Aug. 18.

Instead of taking along a war-strength personnel of thirty officers and 250 men, all the units will be skeletonized and the strength of the entire squadron and its convoys will be about twenty-two officers and 80 enlisted men. The sections of the expedition are: Headquarters and Advance section, Recruiting section, Flying and Field Operations section, Photographic section, Balloon and Airship section, Searchlight and Field Lighting section, Motor Transport section, Supply section, and a detachment section to handle mail and provide personal comforts for the men. Major Baldinger will operate the unit as a mobile army post.

The Balloon section will carry six propaganda balloons, an observation balloon, and a working model of a dirigible operated by electric power. The Searchlight division will carry a war light with a diameter of sixty inches and capable of throwing a strong light about three miles. The strength of the light is about 300,000,000 candle power, and an airplane pilot is able to see it at night for a distance of 110 miles. A special mobile power plant will furnish electricity for this light and for the lighting system of the convoy.

In the convoy will be kitchens, repair shops, a motion picture machine and screen, the new "loud-speaking" wireless telephone or amplifier, and many other features to interest the public in the branches of the service represented in the unit. There is also equipment for charting the air and making mosaic maps.

The official announcement of the flight follows:

"Only a small percentage of the people of the United States have any idea of what an airplane in flight looks like and a very much smaller percentage have any idea of how an aero squadron in action is operated and maintained away from a fixed base, so the Air Service will start a Nation-wide campaign of education along practical lines to show the people the actual workings of an aero squadron and at the same time to use this campaign as a means for recruiting for all branches of the military service.

"The work of conducting this campaign will be carried on by the War Department and on Wednesday, Aug. 13, a complete aero squadron is to leave Hazelhurst Field, Mineola, L. I., and proceed on the most extensive, spectacular and instructive pathfinding ever undertaken in this country.

"This outgoing tour extending all the way from Mineola to San Francisco embraces stops at 171 cities in fifteen States and covers 4,183 air miles. Base stops are scheduled for the following cities along the itinerary: Philadelphia, Harrisburg and Pittsburgh, Pa.; Coshocton and Columbus, O.; Indianapolis, Ind.; Effington, Ill.; St. Louis, Mo.; Rantoul, Ill.; Chicago, Ill.; Milwaukee and Madison, Wis.; Winona, Minneapolis and St. Paul, Minn.; Fargo, Jamestown and Bismarck, N. D.; Miles City, Billings, Great Falls and Helena, Mont.; Wallace, Idaho; Spokane, Seattle and Tacoma, Wash.; Portland, Salem, Eugene and Jacksonville, Ore.; Reading, Sacramento and San Francisco, Cal. The unit has already completed the aerial mapping, photographing and other work between Mineola and Pittsburgh and the first jump from Mineola will be direct to Columbus, O., where they are scheduld to arrive Aug. 18.

"This recruiting unit will be known as the 'All-American Pathfinders' and will consist of twenty-two commissioned officers and eighty enlisted men, as compared with the usual personnel of thirty officers and 250 enlisted men to accomplish the same amount of work, in consequence of which the task before those selected is anything but an easy one, and the officers and enlisted men who are to be included are specially selected, each for a specific task for which the individual is particularly adapted by reason of extensive experience and training. The officers are:

"Majors Ora M. Baldinger, Air Service, Commanding Squadron, and Matthew L. King, Air Service, Engineering Officer; Capts. Fred B. Weiners, Air Service, Executive Officer; John Howry, Air Service, Photographic Section; John D. Jones, Air Service, Balloon and Airships Section, and Harry J. Vogel, Air Service, Recruiting Section; First Lieuts. Kenneth C. Leggett, Air Service, Aerial Information, Routes and Mapping; Roy W. Grower, C. E. Searchlight; Donald G. Frost, Air Service, Supply Officer; M. F. De Rosier, M. C., Medical Officer; George T. Wise, Air Service, Pathfinder Pilot; P. D. Riblet, Air Service, Photographic Section; M. T. Boggs,

(*Continued on page* 10)

International Handicap Race Proves Popular

Machines of Many Types Entered in New York-Toronto Contest For Prizes Totaling $10,000—Entries for Race Close August 23

The international handicap airplane race, for which John McE. Bowman has offered $10,000 in prizes, which starts Aug. 25, is bringing out entries of all classes of planes. Among those already entered, in addition to American machines, are British, Canadian, Italian and French machines. Several captured German Fokkers were also entered, but were withdrawn upon the protest of Capt. T. Bosc of the French High Commission.

Permission has been granted by the War Department to Army fliers to participate and while they may not receive any of the cash prizes, they may be presented with trophies equal in value.

The official announcement of the race declares it to be under the joint auspices of the American Flying Club and the Aero Club of Canada, under the rules and regulations promulgated by the American Flying Club, with pilots and airplanes licensed by the United States joint Army and Navy Board on Aeronautic Cognizance.

The contest is to start simultaneously from New York and Toronto, on Aug. 25, over a round trip circuit with obligatory control and inspection stops both ways at designated flying fields located in Albany, Syracuse and Buffalo, N. Y. The object of the contest is to promote the science and sport of aviation in a manner reflecting its safety, reliability and permanence, and is open to all approved types of airplanes, but cannot be competed for by aircraft of the flying boat or seaplane type.

The Hotel Commodore Prize, offered by John McE. Bowman, President of the Hotel Commodore, through the American Flying Club, consists of a cash prize of $10,000 divided into handicap prizes totaling $7,500 and speed prizes totaling $2500 in cash.

There are nine prizes in the Handcap Contest, to be awarded as follows: 1—$2500, 2—$1500, 3—$800, 4—$600, 5—$550, 6—$500, 7—$450, 8—$400, 9—$350, in cash, or equivalent.

There are three prizes in the Speed Contest, to be awarded as follows: 1—$1500, 2—$700, 3—$300 in cash, or equivalent.

In addition, there are also to be offered for competition by entrants, while competing for the Hotel Commodore prizes: The Canadian National Exhibition Trophy, the Aero Club of Canada Trophy, and the American Flying Club Trophy.

The award of the Hotel Commodore Handicap prizes will be determined by the efficient and reliable performances of the airplanes and will be determined by the formula:

$$\left[\frac{\text{Flight Load} \times \text{Distance of Prescribed Course}}{\text{Horsepower} \times \text{Actual Time}}\right] \times \text{Index Factor}$$

The Index Factor will be calculated from the best apparent performance among the entries and each other machine handicapped therefrom, in order to bring each airplane's equation initially equal.

The winners of the handicap prizes will be those contestants, complying with all rules and regulations, who show the nine most creditable performances under the Handicap Ruling.

The winners of the speed prizes and trophy will be those contestants, complying with all rules and regulations, who make the round trip circuit in the least total flying time, which shall be the sum total of the actual time taken by contestant to negotiate each leg of the journey between control stops, from start to finish.

The total distance to be covered by contestants is approximately 1040 miles, with distances between obligatory control airdromes of, 149 miles from New York to Albany, 141 miles from Albany to Syracuse, 146 miles from Syracuse to Buffalo, and approximately 85 miles from Buffalo to Toronto.

Entries will be accepted up to midnight of Aug. 23, 1919.

Rules and Regulations

Article 1. The general rules for this Handicap and Speed Contest are to be promulgated by the Contest Committee of the American Flying Club and the events are to be conducted under these Rules and Regulations by the Joint International Contest Committee, composed of the members of the Contest Committee of the American Flying Club and the members of the Contest Committee of the Aero Club of Canada.

Article 2. It is to be an international invitation event, with all contestants (Pilots, or Entrants), and their machines, licensed by the United Staes Joint Army and Navy Board on Aeronautic Cognizance, and all contestants to hold, as well, Pilot's Certificate issued by the Aero Club of Canada.

Each airplane must be identified by the license number issued by the Joint Army and Navy Board on Aeronautic Cognizance, which number must be painted upon the wings and fuselage of the machine in conformity with the specifications issued by the Joint Army and Navy Board on Aeronautic Cognizance.

Article 3. The Contest is to start simultaneously from New York and Toronto on August 25, 1919, and will continue until midnight of August 29, 1919, unless extended by the Joint International Contest Committee.

Article 4. Entries must be made on this official Entry blank, which is provided by the Contest Committee of the American Flying Club. Entrance fee $50, payable to the American Flying Club.

Any number of airplanes may be entered by the same individual, or individuals, as separate entries; but no contestant can replace his machine in the round-trip circuit, except by making an official re-start from either Toronto or New York and then actually making a complete circuit and finishing at the point where re-start was made, in order to be eligible for place in the prize divisions.

Article 5. Entry fees are not returnable, except to those declared ineligible, going in their entirety toward the expense of conducting the contest.

Article 6. The acceptance of entries for the Commodore Airplane Handicap and Speed Contest is discretionary with the Joint International Contest Committee, and is based on the condition that the applicant, his representative or agent, is bound to accept, without any appeal whatever, any decision of the Joint Contest Committee on any matter arising from his entry, and the applicant pledges himself, and his representative, or agent, not to carry any matter arising out of his entry, or participation, into the Courts for review, or adjustment, or otherwise.

Article 7. Contestants will compete for all prizes during their round-trip flight. That is, while competing for the Handicap Prizes they will automatically participate in the Speed Contest, their flying time only being a factor in the Speed events, and applying thereto.

Article 8. Canadian entries will make their official start in this International Contest from Toronto, Canada, and will finish the race at the airdrome in Toronto from which this official start was made, after having made the round-trip circuit to Mitchel Field, Mineola, L. I., N. Y., and return.

American contestants will make their official start in this International Contest from Mineola, New York, and will finish the race at the airdrome at Mineola from which this official start was made, after having made the round-trip circuit to Toronto, Canada, and return.

Article 9. By American Entry is meant any contestant who elects to start from the American side that is, from the official starting grounds at Mitchel Aviation Field, Mineola, L. I., N. Y.

By Canadian Entry is meant any contestant who elects to start in the contest from the Canadian side, that is, from the official starting grounds at the Leaside Airdrome, Toronto, Canada.

Article 10. Short speed trials may be required at the starting fields by the Joint Contest Committee, previous to the official start of machines of each and every entry, in order to check the basis for handicap.

The Technical Committee representatives will weigh machines, complete for flight, including useful load, before the official start from New York and Toronto, and will turn in a report to the Joint International Contest Committee, giving full particulars of flight weight, with fuel carried (gallons), live weight and names, and excess load, if any, which data will be used in determining the weight factor in the performance calculation of the machine in handicap event.

Contestants having started with one or more passengers must replace weight of passenger, or passengers, with duplicating ballast weight, in the event that any part of the airplane flight personnel is depleted during the round trip circuit. This condition is obligatory in the Handicap events, and non-compliance therein will disqualify contestant in all but Speed events.

Article 11. Contestants intending to start in the contest from New York will make their official getaway, after having satisfactorily complied with all inspection and attendant Rules and Regulations, from Mitchel Field, Mineola, L. I., under the supervision of the official starter in charge of the U. S. start of the contest.

Contestants will proceed thence to New York City and, at an altitude considered reasonably safe by contestant. make two complete circles above Pershing Square and the Hotel Commodore, and then proceed northward to the first obligatory control stop, located at the Quentin Roosevelt Memorial Aviation Field, Albany, N. Y.

After complying with all Rules and Regulations applying to contestants when within the jurisdiction of the Contest (and Technical) Committee representatives at control stops, contestants will then proceed to Syracuse. At Syracuse. the control stop will be the flying field of the Aero Club of Syracuse, known as Bethka Farm Aviation Field.

Contestants will then proceed to Buffalo, after properly checking out at Syracuse. At Buffalo the control stop will be the Curtiss Aeroplane and Motor Corporation airdrome. After complying with control stop Rules and Regulations, contestant will be started on to Toronto. The Leaside Airdrome of the United Aircraft Engineering Corporation will be the Toronto control stop.

When, in the judgment of the Contest Committee representatives, the contestant has complied with all requirements, and is ready to start on the return legs of the journey, he will be officially started from the Leaside Airdrome and will proceed thence on a westerly course in the direction of the grounds of the Canadian National Exhibition, over which he will be required to make two complete circles at an altitude which, in his judgment, is reasonably safe; and then proceed onward to the Buffalo control stop, located at the Curtiss Airdrome. He will then proceed to Mitchel Field, Mineola, Long Island, for his official finish of the contest, having stopped at Syracuse and Albany, respectively, complying thereat with all the rules and regulations governing the contest.

Article 12. Contestants intending to start in the contest from Toronto will make their official getaway, after having satisfactorily complied with all Inspection and attendant Regulations, from the Leaside Airdrome, Toronto, Canada, under the supervision of the official starter in charge of the Canadian start.

These contestants will proceed on a course which will take them over the grounds of the Canadian National Exhibition, over which they wil be required to make two complete circles at an altitude which, in their judgment, is reasonably safe, and then proceed on to the Buffalo control stop located at the Curtiss Aerodrome, Buffalo, N. Y. The Canadian contestants' route will then take them to Syracuse, Albany and Roosevelt Field, Mineola, L. I.

After being started on their return trip, the Canadian contestants will proceed to New York and, at an altitude considered reasonably safe, make two complete circles above Pershing Square and the Hotel Commodore, and then proceed Northward to the Quentin Roosevelt Memorial Field, Albany, N. Y., thence to Syracuse, Buffalo and Toronto, having stopped at each obligatory control and complied with all rules and regulations thereat, and en route, for official finish at the Leaside Airdrome.

Article 13. Competitors may stop as often as they wish to refill tanks, make adjustments, replacements, repairs, etc., but only when such refilling, replacements, adjustments or repairs, etc., are conducted at obligatory control stops will the time required thereon not count against the contestant.

Article 14. In starting, contestants' time will be taken at the instant the wheels leave the ground on the take-off. In landing, time will be taken the instant any part of the running gear of the machine touches the ground.

Article 15. The start and successive starting at controls, as well as landings, shall be made under the supervision of the representatives of the Contest Committee, who schall verify, or have verified, through the representative of the Technical Committee, the safe condition of the airplane, the authorized passengers, if any, the useful load carried by each airplane, record the time of departure, the time of arrival, condition of machine, etc., and submit a certified report to the Joint International Contest Committee, covering all the facts in connection with the proceedings while in the environs of control and while the contestant and his machine are under the jurisdiction of said representatives.

Article 16. Individual machines, that is the airplane itself, together with its power plant, propeller, accessories, and equipment must be of approved design and construction, operative, safe and rigidly inspected, and are all subject to final inspection and approval of the Technical Committee of the Club, which will certify to the condition of the airplane and its privilege to start in the contest, and successive continuance in the competition.

Article 17. All pilots must hold and exhibit at any time upon verbal, or other, request of the representatives of the Joint International Contest Committee, the license to operate or use airplane for civilian flying purposes issued by the U. S. Joint Army and Navy Board on Aeronautic Cognizance, and also the certificates issued by the Aero Club of Canada.

Likewise, all contestants must hold and exhibit upon request certificate of inspection and mechanical safety of airplane, with indorsements, issued by the Joint International Contest Committee to contestant previous to initial start.

Article 18. Each contestant will be given this certificate of inspection and mechanical safety of airplane, which must be carried at all times and shown at any time, upon verbal or other request, to Contest and Technical Committee representatives. This certificate will be signed at the official start at Mineola, N. Y., or Leaside, Toronto, Canada, by the representative of the Contest Committee and must be endorsed at each obligatory control stop by the representative of the Technical Committee before contestant can be started off, upon the next leg of the circuit by the Contest Committee representatives.

This official starter at each control stop will not declare contestant ready to proceed to the next control stop until he has received this certification indicating the safe condition of the machine to proceed in the competition, on to the next control.

Article 19. In the event that inspection of airplane reveals, in the opinion of the Technical Committee representatives, the necessity for repairs, adjustments, or replacements, or discloses derangements considered to affect the mechanical safety of the machine, the entrant must have necessary repairs made upon the airplane and, upon evidence of their satisfactory completion, in the opinion of the Technical Committee representative, entrant will be given his required progressive certification of Inspection and mechanical safety (condition) of machine, and the Contest Committee representative and starter may then notify the contestant that he may proceed on the next leg of the flight, when called for departure.

These enforced repairs, adjustments, replacements or delays attendant thereto, within the control, will not count against the contestant except in the case of a tie for prize, when the prize will be given to that contestant requiring the least time and effort in affecting such repairs, adjustments or replacements, etc.

The local Technical Committee Representative will

(*Continued on page* 12)

News of the Army and Navy Air Services

Ellington Field Flyers

The Ellington Field, Houston, Texas, transcontinental fliers, in four De Haviland planes, flew from Elko, Nev., to Salt Lake City, altitude 14,000 feet, a distance of 200 miles in 160 minutes last week. Since leaving Houston these four planes, traveling via San Diego and San Francisco to Salt Lake City, have covered a total distance of 2,759 miles in 1,890 minutes.

237 Miles in 2 Hours

Piloting a De Haviland biplane, Lieut. Eugene H. Barksdale flew from Mineola to Brockton, Mass., a distance of 237 miles, in two hours flat. The biplane is equipped with a twelve cylinder, 400 hp. Liberty engine.

Colonel Clagett's Flight

Fying at the rate of 168 miles an hour, Col. H. B. Clagett accomplished the feat of travelling from Washington to the Statue of Liberty in one hour and fifteen minutes, Aug. 8.

The flight was made in a De Haviland machine at a height of 4,000 feet. Sergeant Ralph Kratz flew with Colonel Clagett as a passenger.

The best previous record for the 210 mile flight was one hour and 24 minutes or at the rate of 150 miles an hour.

Long Balloon Flight

Pilot Lieut. Hoke S. O'Kelly, with Lieuts. Carlton F. Bond and Wm. H. MacIlwain and Sergts. Louis N. Morris and Edwin Schmeider as passengers in a 35,000 cubic feet free balloon, made a flight from Post Field to Lexington, Nebr., 600 miles in 31 hours. The maximum altitude reached was 5,400 feet. Five landings were made en route.

Planes Welcome Fleet

Preparations are being made to welcome the Pacific Fleet in Hawaiian waters, orders having been received from the Department Air Service Officer to prepare four De Havilands, four Curtiss H's, two seaplanes of the HS type and one N-9 seaplane for the occasion.

Photographs of Fleet

Capt. Lowell H. Smith, who holds the record from San Francisco, Cal., to San Diego with a non-stop speed average 148.44 miles per hour, with newspaper men in a De Haviland flew out to sea 150 miles southwest of San Diego to make pictures of the Pacific Fleet Aug. 6.

He left Rockwell Field, San Diego, at 9:22 in the morning with the photographs, arriving at San Francisco at 5:45 p. m.

Lieut. H. A. Halverson accompanied Captain Smith.

Mexicans Protest Flight

Mexican military officers have protested to the United States Army headquarters at El Paso against what they said were violations of Mexican sovereignty by American army airplanes flying over the border.

They asserted an American aviator flew eight miles south of Juarez last week. American officers repudiated the charge.

Makes Difficult Flight

Lieut. Earl E. Neubig from Mather Field, Sacramento, Cal., completed one of the most difficult flights ever undertaken recently, flying from Sacramento, Cal., into Yosemite National Park, the floor of which is 4000 feet high. In order to make a landing in the park it was necessary for Lieut. Neubig to gain an altitude of 11,000 feet and spiral down between the walls of the canyon, which are 5000 feet high and one-quarter of a mile wide. He landed on the field, which was very difficult to reach owing to the high trees and wires surrounding it and his plane stopped rolling just about ten feet in front of a multitude of park visitors who were there to greet him. Lieutenant Neubig carried a package of mail and personal messages from State and Federal officials to the superintendent of the park and delivered also a special edition of the *San Francisco Bulletin.* He was warmly received by the Park officials and was presented with a handsome gold medal on behalf of the officials of San Francisco and the Yosemite National Park for his achievement.

Flying time from Mather Field to San Francisco—90 miles—was 90 minutes, altitude 4500 feet, from San Francisco to Yosemite, 180 miles in 100 minutes, altitude 12,000 feet. Yosemite to Mather Field, 90 miles in 90 minutes.

Lieutenant Neubig's trip was made in Curtiss H equipped with Hispano-Suiza motor. He left San Francisco at 6 a. m., and was compelled to fly over San Francisco Bay at an altitude of 50 feet owing to fog, which was so low that it was resting on the water in some places.

Forest Fire Patrol

The extension of the Aerial Forest Fire Patrol to cover a portion of the forests of Oregon has been authorized by the Director of the Air Service. Headquarters of the squadron has been established at Salem, Ore., and for the present will consist of five officers and seven enlisted men operating eight airplanes under the direction of Major A. D. Smith. Preliminary flights were made Aug. 2 by Lieut. E. C. Kiel and Sergt. Frank McKee of the Mather Field staff.

Six fires were discovered, quickly reported with slight damage. During the six weeks ending Aug. 2 the patrol made 373 flights a distance of 45,376 miles in 38,545 minutes and reported 56 fires which were extinguished with nominal damage.

In addition to this the Balloon Division maintains night and day observation.

Two Miles a Minute

Flying 610 miles through fog and clouds at a speed in excess of two miles a minute, Captain Lowell H. Smith delivered a letter from Mayor Rohlfs of San Francisco to Admiral Rodman at San Diego, Aug. 9, according to an announcement from the Air Service.

Most of the flight, completed in 302 minutes flying time, was at an altitude of 10,000 feet.

Long Island Map

The touring bureau of the American Automobile Association has prepared a new map of Long Island, designed to be of assistance to aviators.

The map indicates the location of all flying fields, including landing places to be used in case of emergency. The map also shows all railroads and main highways, these two essential features being printed in different colors so as to eliminate possible confusion and permit of instant identification when being consulted in the air.

Fields Not Abandoned

Major Gen. Menoher, Director of the Army Air Service, has denied newspaper reports that orders had been issued closing all the Long Island aviation fields and leaving only four men in charge of airplanes and motors worth many thousands of dollars.

General Menoher said emphatically that no such orders had been issued, or were in contemplation.

Air Service Flying

During the week ending Aug. 9 Army aviators covered a distance of 60,487 miles in cross-country flying in the United States. This established a new record for the service in total number of miles covered in a single week. It does not include the flying of enlisted men undergoing instruction.

Forest fires in Oregon and Washington, according to information reaching the Air Service have been so large recently as to fill the air with smoke over both States and render flying difficult. Oregon has just been added to the first forest aerial patrol which has been in operation in California for seven weeks. During the past week Army aviators in the aviation forest patrol covered a distance of 8,530 miles in the States of California and Oregon and discovered thirty-five fires. During seven weeks of operation the aerial forest patrol has covered 54,906 miles and discovered ninety-one fires.

Flies Over Sierras

The first enlisted man to fly over the Sierra Nevadas is Sergeant T. J. Buckley. He flew in a Curtiss JN-6-H from Sacramento, Cal., to Calneva, a distance of 195 miles, in 108 minutes, and from Calneva to Reno, sixty-five miles, in forty-eight minutes. The altitude passing over the mountains was 14,000 feet.

1400 Miles in a Day

Lieut. H. Waddington, U. S. Air Service, will soon attempt a one day flight from Houston to Washington, D. C., a distance of 1,400 miles. A Curtiss R machine equipped with Liberty motor and an eight-hour capacity of gasoline will be used.

Over Canadian Rockies

Capt. A. C. Hoy, D. F. C., accomplished the first passage of the Canadian Rockies by airplane Aug. 7, leaving Vancouver, B. C., at 4:15 a. m. and landing at Lethbridge, Alberta, at 6:22 p. m., covering nearly 500 miles in a little more than 14 hours.

Travel by Airplane

General Order No. 76, Section IV, War Department, June 26, 1917, has been amended by the addition of the words "or airplane" after the word "ship." The same requirements will hereafter be prescribed for travel by airplane as by ship.

Camp Upton Field

The construction of an aviation landing field at Camp Upton, L. I., large enough to accommodate the largest aircraft has been begun. The field will be part of the new permanent camp improvements.

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Formerly Air Service Journal

Ownership of the Air

THE discussion as to the ownership of the air that has been taking place in the newspapers of the country is bringing to the surface a great amount of superficial comment. Several minor courts have given decisions regarding the destruction of crops or other property but the whole question is too large to be viewed from a local angle.

Congress should at once take steps to enact legislation regulating aerial navigation. In the absence of federal control there is likely to be state and local legislation which would be as confusing as the present automobile laws. In the absence of any regulation the danger of accidents and loss of property will be ever-present. The development of aeronautics in the United States will be in proportion to the sympathetic support given it by Congress and it is obvious that local legislation, no matter how well intentioned, can have no other effect than to hinder the advance of the science without at the same time achieving the desired degree of safety.

The fundamental consideration to be put uppermost in all legislation for aircraft is that aerial navigation is international in scope and therefore regulation must take into account the aircraft of other countries. In addition, the air is coming to be regarded as one of the most important areas of national defense. On this score the air must be free to all military or naval aircraft and if this is allowed, commercial aviation must receive the recognition which will permit the entire people to benefit from it. Unquestionably the problem of aerial highways will have to be given great study and they will eventually assume a much greater importance than would now seem possible.

That the sovereignty of the air is versed in the nation controlling it is a principle that cannot be changed without going back to the archaic doctrine that the holder of a deed to a plot of ground exercises control " as high as heaven and as deep as hell." The United States on the grounds of self-defence alone will have to follow the legal status of the air adopted by other nations, and this is unquestionably for a reasonable freedom of the air.

With this point of view, must come federal regulation and control of the air, which will protect not only the ships of the air but the owners and operators of airdromes. With this protection, will come adequate means for the safeguarding of life and property on the ground. Backed by federal legislation the land owners will have a feeling of security that no local laws could give them.

Perhaps the strongest argument for federal initiative is found in the matter of aerial terminals. Standards should be provided and municipalities should have the advantage of all the technical engineering advice at the command of the national government so that airdromes, as established by the various cities, will be uniform in specification and will be included in the proper class. Much pioneer labor along this line has already been performed by the directors of our Army and Navy air services who have recognized the principle of uniformity.

For a municipality or a state to prohibit flight or even to attempt to establish flight levels will be to confuse the labor which rightly belongs to the national Government. International practice must determine many national rules. The Army Air Service, acting in control of its flyers all over the United States, has directed them not to perform stunts at a level lower than 4,000 feet, this being the height agreed upon as sufficient to enable a pilot to regain command of his ship. This is cited as an example of regulation as against prohibition. Under proper supervision it is possible to permit flights which, if judged locally, would be absolutely barred.

National judgment, not community prejudice, should be the formulating guide for rules of operation in the air; for placing signals on aircraft and airdrome and for their proper display. The use of airplanes in interstate commerce is limited as yet, but it is not difficult to foresee dangerous complications if states undertake to prescribe rights of way, turns and precedence so that a pilot, in flying from New York to San Francisco, would not only be in frequent disobedience of local statutes, but would actually be placed in peril because of the persistent confusion.

Federal regulation, inspection and issuing of pilots' certificates will give a stimulus to aviation in this country, such as nothing else can do. Obviously free flying regardless of control is a thing of the past. The sooner Congress enacts forward-looking legislation the better for military, naval and commercial aviation.

Air Mail Advances

MAKING the postage for airplane mail the same as for other mail matter is a great step in advance for the postal mail service. It indicates that mail can be sent by airplane at a cost that will compete with other means of transportation.

The problem of carrying mails is not wholly one of transportation, but as well of distribution. When mail can be distributed in terminal post offices, it saves the great expense of distribution on mail cars and the expense of the latter is easily apparent when the amount of space required in mail cars on fast trains is considered. Thus haulage of heavy mail cars with comparatively little mail contents has become a large item of cost in the postal charges. If the airplane by its speed can not only save time, of course one of the main factors in all mail problems, but also allows distribution at large terminals, it will have achieved a notable success.

Carrying only specially stamped airplane mail would never be a commercial success, but if the airplane can compete with the railroad and decrease distribution expense, a great development of the air mail may be expected.

On a Matter of Convenience

WHILE several bills are before Congress to create a " Department of Aeronautics " and a United States Air Force it is perhaps not too late to call attention to the desirability of simplifying the official name of the proposed government agency to *Air Department.* The word *aeronautics,* besides being clumsy and long, gives the average American about as much spelling trouble as the word *aeroplane*—now defunct in this country. The Navy so well realized this that what was formerly known as the Director of Naval Aeronautics is now called Director of Naval Aviation—though his functions comprise the supervision of lighter-than-air as well as heavier-than-air craft, so that technically speaking this term is a misnomer. *Air Department* would fall in line with the American tradition of simplifying complicated matters; technically it would be correct; and finally it would well fit in with *Air Force.* The latter is so brief and expressive a term that it might eventually come to be used by public and press instead of the chaotic denomination one now finds, ranging from Airship Service to Flying Division and Airplane Corps.

Notes on Technical Aeronautics

Parachutes and Flares

With the coming of the large commercial machines, it is natural that a reasonable degree of safety be assured the passengers. Experience of the past has taught us that the hazard of flying, though reduced to a minimum, has not been entirely overcome. Careful design has done much to insure against accident, but mishaps due to carelessness and fire cannot be avoided. For this reason, it is evident, that in the near future every machine will be equipped with parachutes.

Several types of parachutes have been designed and built, but an efficient airplane parachute has not yet been produced. Many successful drops have been made from airplanes under control of a pilot, but it is unknown how a parachute would act if the aviator left a machine that was in a nose dive or tail spin.

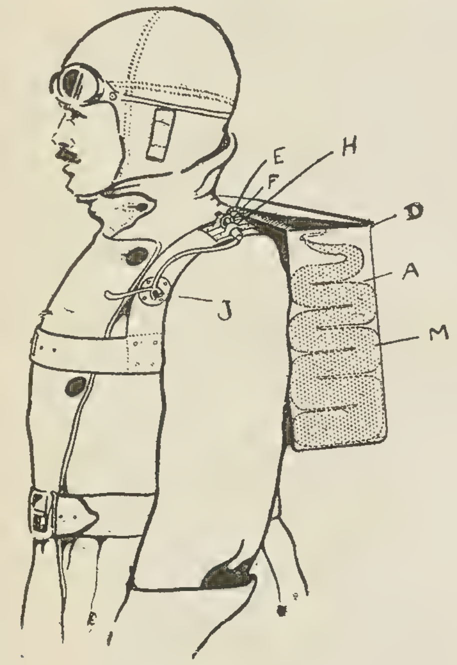


Fig. 1

Lieut.-Col. H. S. Holt of the British Army has done much for the advance of parachuting, and an abstract of an article by him, which appears in a recent issue of *The Aeroplane*, is of considerable interest. With few exceptions, all the single parachute systems of today function on the same principle. The parachute case is fixed to the aircraft and the parachute and lines are packed inside. The main cable of the parachute is made fast to the passenger's harness, so that when he jumps overboard his weight withdraws the parachute, the crown or apex being the last to leave the case.

In German designs the case is usually carried on the passenger's back and attached to the harness, though in one type it is hinged in such a way that the passenger can sit on it when not in use. In this type the apex is fastened to the airplane by a cord and when the aviator falls, the weight of his body breaks the cord and so releases the parachute. But, although somewhat different in design, the German parachutes have the same defect as our own, viz., that they offer little or no chance of escape from a falling machine.

Undoubtedly the best way to encounter this obstacle is by the use of the compound or tandem parachute. This type consists of a large or main parachute, to which is attached a smaller or pilot parachute. The use of this type also simplifies design, for it can readily be seen that the estimate of loads and computations of a parachute that is launched from a rapidly moving airplane causes all kinds of complications and difficulties in design. Whereas, the strain on the main parachute of the tandem type is always the same within small limits and can be accurately estimated.

A small, strongly built pilot parachute is released and opens first. Its pull then withdraws the main parachute from the case. By simple timing devices the release of the main parachute can be delayed as long as desired; but the strain on it when opening will always be the same, because a well designed pilot parachute attains its terminal velocity in a few feet. The essentials for a good pilot parachute are smallness of area relative to the main parachute, great strength of material and design and rapid inflation. The pilot parachute is attached to the main parachute by cords from the cable of the pilot to the circumference of the hole in the main. Correctly speaking, the pilot cable should be attached directly to the cable of the main, but there are obvious practical objections to this. Fig. 1 shows a late model in position on the passenger's back. The main parachute *M* is carried in a receptacle *A*, to which there is a spring lid *D*, which is normally kept closed by a spring hinge. The main parachute is attached to a shackle. The cable connecting the main parachute to the pilot parachute is furnished with a spring bolt *H*. This spring bolt is so constructed that under ordinary conditions it is free to open so that when the pilot parachute is released, it inflates and pulls out the main parachute at once. It is fitted with a small lever *J* and a strong spring on the harness, by turning which the release bolt is prevented from being disengaged and so will not allow the main parachute to be withdrawn. In certain circumstances the passenger may wish to fall for a considerable distance under the pilot only. For instance, if he found he was near the coast and was afraid that if he opened his main parachute he might drift out to sea, he could drop very quickly to within a few hundred feet of the ground and then release his main parachute. Another case would be an aviator in war time, where the pilot parachute would offer a much smaller target and at the same time would land him much quicker.

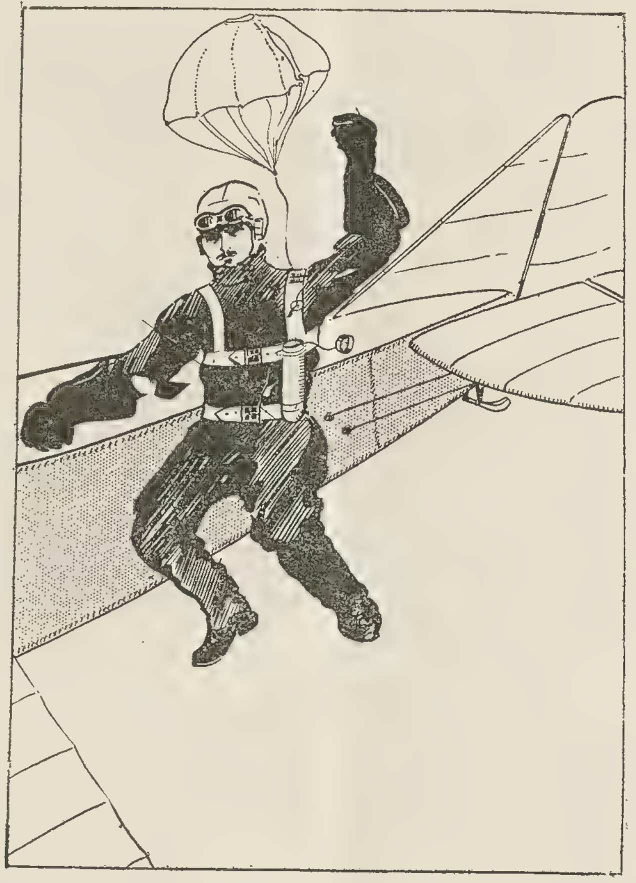


Fig. 2

When falling under the parachute a man is apt to grip and cling onto anything that he can get hold of, and the lever locking this bolt is arranged in such a way that he cannot do this, and the moment he lets go of the lever the bolt will be released. Fig. 2 shows a man in the act of releasing the pilot parachute.

The main parachute is constructed in the following way: Down each seam a double tube of silk is sewn extending to about 6 inches from the circumference of the parachute. By means of a hook wire this line is drawn up through the two tubes in a double loop. (See Fig. 3.) In this manner all risk of entangling is absolutely eliminated.

Owing to the fact that the tubes are not carried down to the edge the extreme edge is left free and inflates instantly. This can plainly be seen from Fig. 4 and Fig. 5.

At the moment the cords become taut the strain falls on the pilot parachute, which acts as a brake on the whole system and lessens the shock when the main parachute opens to full expansion a moment later. Thus the shock is divided into two portions separated by a fraction of time from each other, and for this reason it seems that shock absorbers will be quite unnecessary.

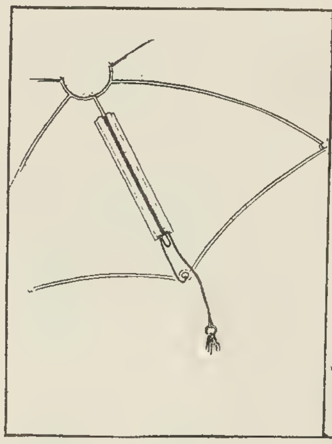


Fig. 3

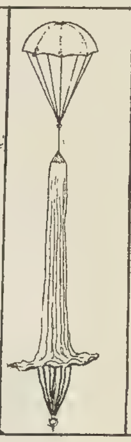


Fig. 4

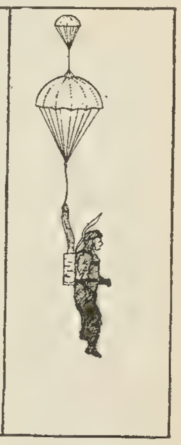


Fig. 5

To prevent a vacuum from forming in the main parachute a small paper disc is placed in the central hole and when the pressure becomes great enough the paper bursts. This hole is necessary to stabilize the parachute and also to prevent capsizing.

It can be readily seen that this method of construction obviates the use of elaborate receptacles and elaborate systems of folding the lines, which may take hours to carry out, and, in any case, involve great risk of error unless done by experienced hands.

Gold that Floats in Air

Gold leaf is beaten so thin that it will float in the air. A sheet of this leaf, 3½ inches square will be only 1/200,000 inch thick, or even thinner. An ounce of gold, by being reduced to leaf may then be given a surface on 200 square inches, and it takes only a very small piece of gold to weigh an ounce. Other metals are similarly reduced to great thinness, only those of the most ductile kind permitting such treatment.

As used in mechanical and scientific work these products are known as foils, being thicker. Mirrors are made by applying silver leaf or foil to the back of a piece of glass. Tinfoil, the commonest of these products, has a hundred uses. One of the most interesting of these is in the condenser of a magneto. A condenser consists of from 50 to 200 sheets of tinfoil, alternating with mica in expensive condensers or parafined paper sheets in the cheaper sort, each thus insulated from the other and alternately connected with one side of an electric circuit. The complete condenser is no larger than a small wafer and is completely enclosed in waterproof insulation.

To illustrate the amount of surface afforded by this compact element, that used on the largest Dixie Magneto, which is representative of the best practice in their manufacture, has 200 sheets of foil with a total surface of 800 square inches.

Mohawk Valley Field

One more safe landing field available to fliers in New York State, and provided with gas, oil and shelter—such is the Edmond Genet Memorial Field on the shore of Oneida Lake, at Sylvan Beach, dedicated July 26 by Lieut.-Gov. Harry C. Walker.

It is the first expansion of the Mohawk Valley Airplane Corp., organized in Utica last spring, and now operating two planes of the Curtiss JN-4 type in passenger and exhibition work from the Glenn D. Wicks field at Utica. The company incorporated at $30,000 and has been in operation since Memorial Day. A hangar large enough to accommodate three ships has been built with the company's office attached, and the work of building up an aerial business has gone on successfully. The corporation is backed by leading business men of the Mohawk Valley and Lieut. Stuart J. Davies, pilot, has given successful stunting exhibitions in various parts of the state.

The Utica field is on the direct air line from New York to Syracuse, and the new Genet field at Oneida Lake is only a 10-minute pull from the direct route, northwest of Oneida, and easily visible at 2,000 feet over that city. A hangar is to be built at the new field, where the corporation expects to carry on passenger work.

Mrs. Martha Genet of Ossining, the "Little Mother," of whom the famous Escadrille Ace speaks in his letters, was present at the dedication. The field is 1,200 feet long, 350 to 450 feet wide and open completely on three sides. The hard sand near the water is being used for landings and take-offs this year, and the entire field is to be clayed in the early spring.

Location cards are being sent out to the principal Government and privately owned fields in the country showing the location of both the Utica and the Sylvan Beach field. The Utica field is on a line between the Masonic Home, a large brick institution just east of Utica, and the three reservoirs south of the New York Central and West Shore railroad lines.

Paris to Morocco

The Farman Goliath which left the Toussus le Noble Airdrome near Paris shortly after midnight Aug. 11 bound for Casablanca, Morocco, arrived 16 hours and 20 minutes later. The aircraft carried ten persons.

Missouri University

William H. Miller of Missouri University, in writing of the interest in aeronautics at that university, says: "Missouri University contributed well to the personnel of the Air Service, and many engineering students—former Air Service men—have expressed their intention of entering the aviation industry upon their graduation.

"The University of Missouri catalogued a course in Military Aeronautics last trimester, but their instructor, Professor Hedrick, was called to France, and the course has been postponed until his return."

German Air Line

Zeppelin airship service between Berlin and Munich will be inaugurated in the near future, says the *Vossische Zeitung.*

Flights will be made regardless of weather conditions, and it is expected that the journey, an airline distance of 325 miles, will be covered in seven hours. The fare will be $75.

The Royal Jewels

The police of Malmoe, Sweden, are holding two packages of jewels and securities dropped from an airplane and which they believe to be the property of the former royal family of Saxony, according to a Copenhagen dispatch.

Fireproof Airplane

A new flying machine, made entirely of metal, is being exhibited in Berlin. The main part of the machine is made of aluminum. The motor is 160 horse power and capable of making 175 kilometers (109 miles) an hour, carrying six people.

General's Daughters Fly

The two small daughters of Gen. William Mitchell, director of military aeronautics, made a flight of twenty miles in a seaplane last week.

The pilot was their father's first instructor when he was assigned by the War Department to study aviation. The children are Isabel, fourteen years old, and Harriet, nine. They were delighted with their trip.

All-American Pathfinders

(*Continued from page* 5)

Air Service, Photo Pilot; Lawrence E. Cook, Air Service, Detachment Commander, and Leroy M. Wightman, Infantry, Recruiting; Second Lieuts. C. K. Guenther, Air Service, Aerial Information, Routes and Mapping; O. O. Neirgarth, Air Service, Motor Transport Officer; R. F. Pearson, Air Service, Pathfinder Pilot; B. J. Tooher, Air Service, Photo Pilot; William Dudley, Air Service, Pathfinder Pilot; C. C. Shangraw, Air Service, Radio Officer, and J. E. Adams, Air Service, Radio Pilot.

"The duties and functions to be performed by this organiation are manifold and many of the functions are new and of great importance both to the military and the Commonwealth.

"The primary purposes in sending forth this organization, which is the first of its kind in this country, are: Recruiting for every arm of the military service, pathfinding and establishing of aerial mailways for use in carrying Government mails over definitely plotted and mapped routes, selection, location and establishing of landing fields along these aerial mailways; obtaining, cataloguing and recording detailed military information for the air service; the recommendations for placing of steel hangars at certain points along aerial routes by the Government upon the accomplishment by certain municipalities in furnishing Class 1 landing fields, the photographing and plotting from the air of all these municipal landing fields along these aerial routes, the observation and testing of aerial radio phones and the compiling of data with reference to the advantages of establishing radio stations along aerial routes and the final making of a continuous and accurate photographic map of these aerial routes from the beginning to the terminus of the route to be traversed.

"In addition to the above matters of routine duty an extensive campaign of education along aeronautical lines will be carried on with special reference to the development of aviation for commercial uses.

"The organization goes forth to perform these functions with the most modern equipment available and carries all its own tentage, mess outfit, &c., and is really a complete military post moving from one base to the next as its various duties progress.

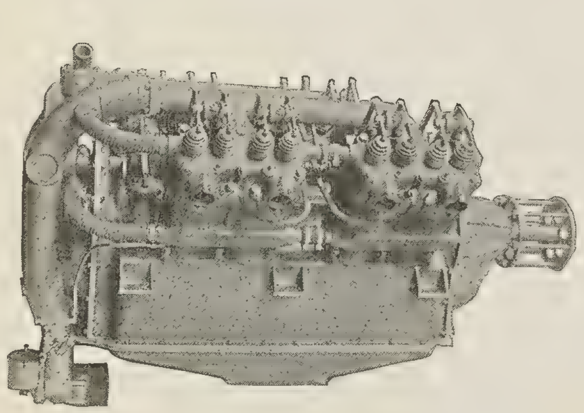
"The motor convoy consists of fourteen one and one-half ton trucks, five standard Liberty five-ton trucks, three staff observation cars, four touring cars, motorcycles, engineer corps searchlight chassis and outfit.

The organization has been divided into sections, each performing a separate function. They are: Headquarters and Advance Section, which will be the executive head for the unit and will also arrange for all base stops prior to the actual arrival of the organization at points along its itinerary; aerial routes, mapping and landing field section, which will compile, catalogue and record all important and necessary aerial information, plot and record maps and aerial mailways, select and establish landing fields, indicate locations and arrange for the furnishing of steel hangars at certain base points by the Government.

"The Balloon and Airship Section carries six specially constructed balloons known as the propaganda type. At base stops these will be flown, and in addition this section will have with it for exhibition purposes a full size type "R" observation balloon, which will be inflated at each base stop so that the public may see and examine the type of lighter-than-air craft that played such an important part in the late war.

"The searchlight and Field Lighting Section, which is being operated by the Engineer Corps of the United States Army, is carrying a searchlight unit complete, which is of the 60-inch anti-aircraft dishpan type. This searchlight was developed by the Corps of Engineers during the late war, was used successfully against the Germans and is the most powerful and brilliant light in the world, having a strength of from 250 to 300 millions candle power. The illuminating range of this light for effective night pathfinding work is 15,000 feet (three miles) and the beam thrown into the air by this powerful lamp can be seen by a plane in the air—weather permitting—for a distance of 110 miles.

"The convoy consists of a train more than half a mile long and will move on a schedule definitely planned as to mileage and motor performance."



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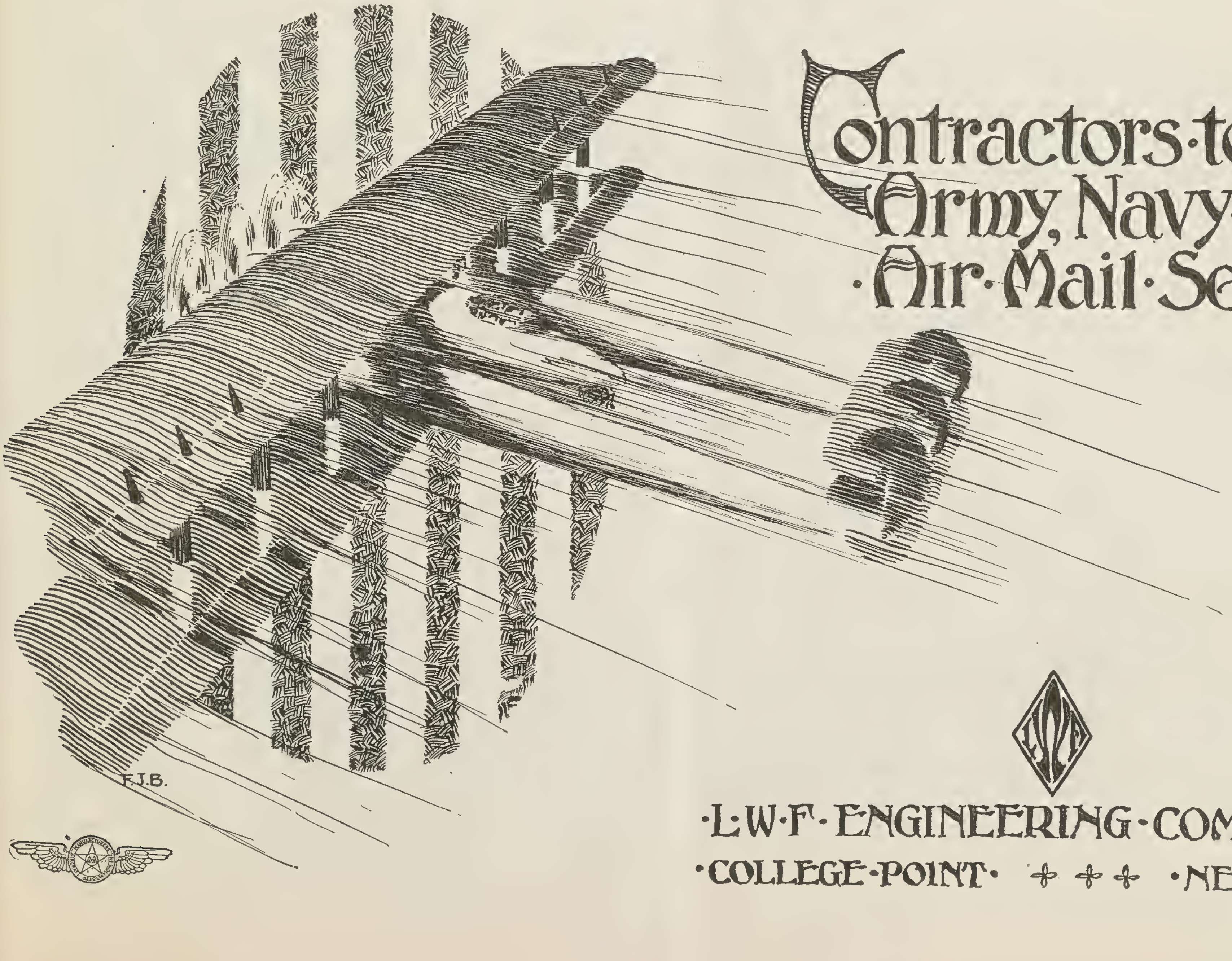

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Handicap Air Race

(Continued from page 6.)

keep an accurate account of all time consumed and material required in affecting repairs, replacements and adjustments on machine while in control stops, and will file this record with the Joint International Contest Committee.

Article 20. Contestant must remain at each obligatory stop for a period of at least thirty minutes after checking in, in order that his machine may be refilled, if necessary, and be properly inspected by representatives of the Technical and Contest Committees, before he will be certified as ready to proceed on the next leg of the flight. He will then be started on the next leg of the flight, by the proper officials, just as soon as practicable. Contestant, with concurrence and approval of starter, may waive his starting assignment and "take-off" later, if, in contestant's and Contest Committee representative's judgment, contestant is justified in delaying starting at any control.

The time elapsing between any assigned start and the actual start by agreement, will not count against contestant.

However, the time of actual starting, under delay privilege, must be set by agreement between the contestant and representative of the Contest Committee, and the contestant will be expected to make his get-away at the set time, exactly as under usual conditions, complying with all Rules and Regulations pertaining thereto.

Article 21. Contestants arriving at any control stop at such time as would preclude the possibility of safely continuing the flight so as to arrive at the next control stop either before darkness sets in, or flying during prospective adverse weather conditions, will be required to remain within the control under the jurisdiction of the Contest Committee representative, as regularly.

In the case of approaching darkness, contestant will remain within the control until the next morning, when he will be regularly started by Contest Committee representative.

In the case of prospective adverse weather conditions, contestant may remain within the control until, in his opinion and that of the Contest Committee representative, it is safe for contestnt to proceed, when he shall continue the flight in the regular manner.

All machines obliged to remain under these circumstances must be properly packed and staked down, in order to minimize danger and insure their safety under the enforced circumstances.

Article 22. In starting from any and all designated flying fields each contestant must make two (2) complete circles (climbing, but maintained within safe gliding distance of the field) of said starting and control airdrome, in order to have attained a reasonably safe altitude before proceeding cross-country on any leg of the circuit.

Article 23. In landing, at any and all designated flying fields, the contestants must make one (1) complete circle of said airdrome, at a sufficient altitude in order to ascertain that the field has been sufficiently cleared of machines and personnel, in contestants' judgment, and thereby effect the best possible landing.

Article 24. Immediately on landing, airplanes must be quickly taxied to the prescribed parking space at each Control Field, where they will remain under the jurisdiction of the Contest Committee until ready to be started on the next leg of the flight, care always being exercised that every opportunity is given fellow contestants for an unobstructed landing and starting area.

All work upon machines in the control stops must be accomplished at these prescribed parking spaces.

Article 25. Contestants who expect to carry passengers must submit names to the Contest Committee five days in advance of date of contest for registration and approval.

Article 26. In case of tie for place in the Handicap Competition, the winner of said place will be the contestant who accomplished the round trip with the least repairs, replacements or overhaul, trouble, or inconvenience with his machine, together with the least number of enforced intermediate stops, not designated as obligatory control stops.

Article 27. In case of tie for a place in the Speed Prize Competition, the prize will be awarded to the contestant whose record shows him to have made the least repairs or replacements or overhaul of his particular machine. In other words, the place will go to that contestant in the tie, who, in the judgment of the Joint Contest Committee, came through the race with the least trouble and inconvenience.

Article 28. Should weather conditions during the prescribed duration of this contest be of such adverse character as to mitigate against the reasonable possibility of contestants finishing the round trip circuit within the time limit set, the Contest may be extended for a definite period by the Joint International Contest Committee, who will serve notice to such effect upon the contestants.

Article 29. The Contest Committee will arrange to identify all Fields designated as obligatory control stops by U. S. Air Service standardized insignia by day, indicating the field and the direction of the ground wind; and by night by suitable standardized lighting arrangements.

Article 30. It is considered imperative that all flights be made with the aid of approved maps, even though the course can be easily maintained from prominent terrestrial objects. Contestants can provide their own maps, but the Contest Committee engages itself to supply all necessary data with details of important terrestrial identification, to incorporate on these maps.

Article 31. Contestant will be required to exercise every precaution and discretion which will help make the contest a success and of great public interest. Any contestant who, in the judgment of the Joint Contest Committee, has committed any jeopardy to the safeguarding of the public interest, or endangers his own property, or that of others, by unreasonable judgment or activity, will be disqualified by written notice from said committee.

Article 32. All airplanes must carry, at all times ready for use, at least one Pyrene, or other fire extinguisher conveniently located in cockpit or nacelle. It is desired as well that each machine carry a small, light First Aid kit.

Article 33. Protests will not be entertained unless presented in writing, accompanied by the sum of $10, which will be returned only if the validity of said protest is sustained.

Article 34. These articles, excepting those clauses in regard to handicap determination and award of prizes in the handicap event, of the General Rules and Regulations, governing the contest for the handicap event, will also apply to the concurrently run speed event for the $2,000 cash prize, or equivalent.

Article 35. Points not covered by these articles or Rules and Regulations shall be subject to supplementary Rules and Regulations and any such special Rulings as may from time to time be made by the Contest Committee of the American Flying Club.

Article 36. The contestant (Pilot, or Entrant, or both) shall be solely responsible to the officials for the due observance of all these Regulations, and supplemental changes therein or additions thereto, and shall be the person with whom the officials will deal with respect thereto, or with any other question or questions arising out of these events.

Article 37. Contestants starting from New York will meet at the American Flying Club on the evening of Aug. 24 for final interpretation and discussion of all Rules and Regulations governing this contest.

Contestants starting from Toronto will meet at the Headquarters of the Aero Club of Canada on the evening of Aug. 24 for similar and duplicate interpretation and discussion of all Rules and Regulations.

Article 38. The contestant by entering, hereby agrees that he is bound by the Rules and Regulations herein contained, or to be hereafter issued, in connection with these events.

Article 39. The interpretation of these Rules and Regulations, or any to be hereafter issued, lays entirely with the Joint International Contest Committee of the American Flying Club and the Aero Club of Canada.

Article 40. The Joint Contest Committee of the American Flying Club and the Aero Club of Canada will notify only actual entrants of any changes in, or additions to, the present Rules and Regulations contained therein.

All awards of cash prizes, or equivalent, and trophies, will be made within ten days after date contest is declared closed, at a dinner to be given by the Hotel Commodore.

Suitable fuel, oil and water will be available to the contestants at all control stops throughout the period of the contest.

The Contest Committee will have on hand an ample supply of equipment necessary to properly stake down all machines which are required to be held at control stops.

The Contest Committee will provide reasonable police protection for all machines at control stops and will render every possible assistance to contestants to insure the safety of all machines and equipment. No persons, other than the members or representatives of the Contest Committees of the American Flying Club and the Aero Club of Canada, Local Committee, Technical Committee, Official Starter and Timer, and the assigned crews of the machine, with not more than two mechanics or assistants per entry, will be allowed out on the prescribed landing fields at any time.

Regarding preparations for the flights, it is contemplated that contestants may wish to provide a small supply of propellers, wheels, tires and small spares at any of the control stops. In order to relieve the entrants of the necessity of maintaining stock-keepers at the various points, the Contest Committee will arrange to have this stock of supplies, belonging to the individual contestants, placed, with proper identification, in the charge of a representative of the Contest Committee located at control stations, and they will be issued back to contestant on his written authority.

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BUREAU OF STEAM ENGINEERING,
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R. S. Griffin
Engineer-in-Chief, USN.
Chief of Bureau.

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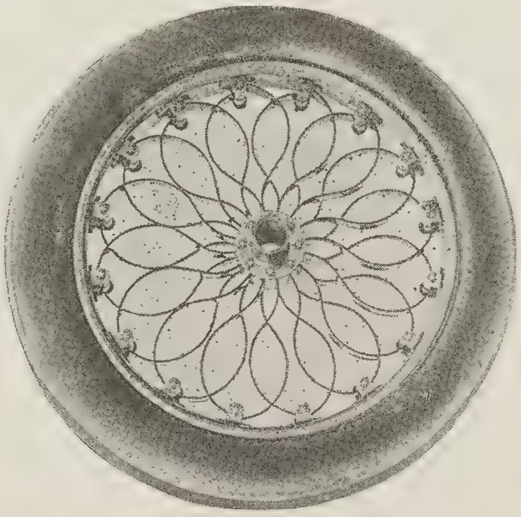

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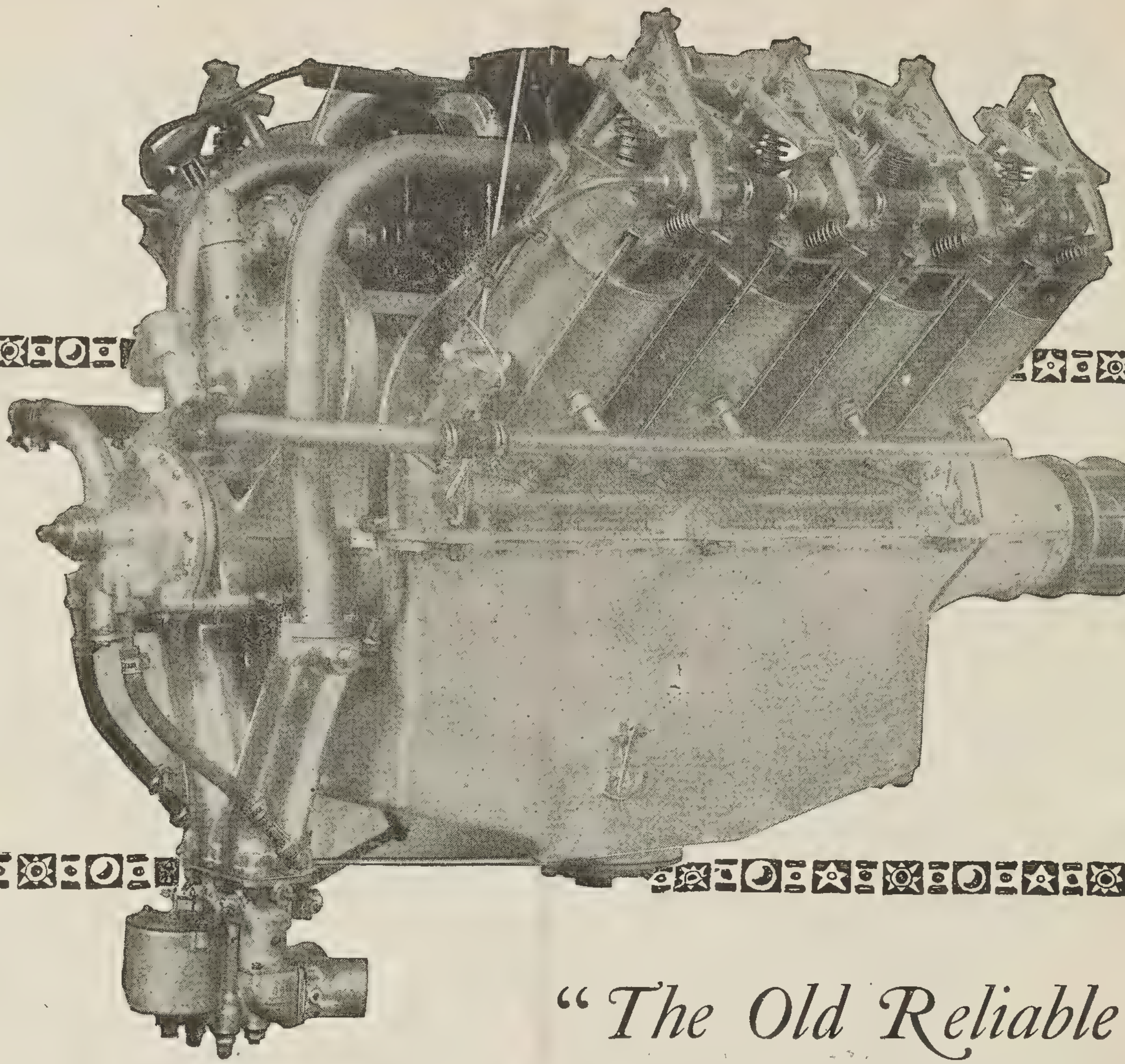

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AIRCRAFT JOURNAL

August 23, 1919 *Every Saturday* *Price Ten Cents*

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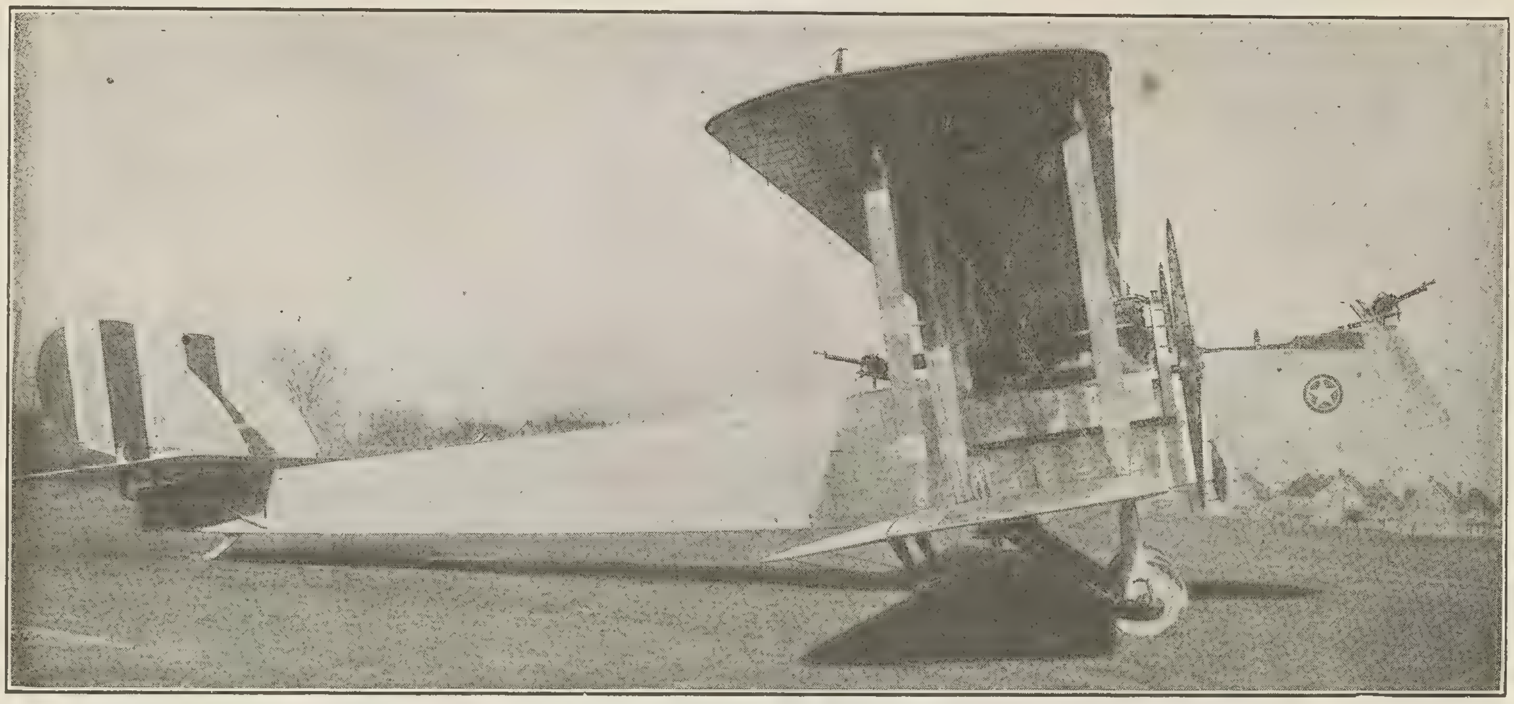
Bristol "Braemer" Triplane in Flight



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Aviation Mission's Report Published

Concentration of Air Activities Under Single Head, Commission Recommends

CONCENTRATION of the air activities of the United States—military, naval, and civilian within the direction of a single Governmental agency created for the purpose, co-equal in importance with the Departments of War, Navy, and Commerce, is the recommendation of the American Air Mission, headed by Assistant Secretary of War Crowell, recently returned from Europe after an extensive study of European air establishments.

The proposed Air Department would be charged with full responsibility for "placing and maintaining our country in the front rank among nations in the development and utilization of aircraft in the national security, and in the advancement of civil aerial transportation and communication arts."

The organization of the proposed Air Department would call for a civilian Secretary of Air, a member of the Cabinet; with a civilian Assistant Secretary of Air; and five or more chiefs of such sub-departments as civil aeronautics, military aeronautics, naval aeronautics, supply and research, finance, and the like; and an advisory Air Council, constituted by the Secretary of Air and including among others his assistant and the chiefs of the sub-departments.

The Mission's report shows that its opinions are advanced after conferences with the Air Ministries of Great Britain, France, and Italy, with ranking Army and Navy officers of all three nations, and with the foremost aircraft manufacturers of the principal Allied nations.

Concerning commercial aviation, the Mission emphasizes the necessity of conserving the American aircraft industry built up during the war, "ninety per cent of which has been liquidated" since the armistice. Some definite Government policy is necessary to save and revitalize the remaining ten per cent for the development of aerial transportation for commercial purposes, that the Mission predicts will "become one of the great transportation mediums of the world and will continue to offer the fastest and most direct means of transportation known to civilization."

The stage is set, for the first time in the world's history, for a close international coöperation in the development of a great art at the very threshold of its commercial utility, the Mission declares, and the United States must sooner or later follow the leads of Great Britain, France, Italy, and Japan to set up a single authoritative point of contact for the conduct of all international aviation affairs, legal, operational, technical, and political.

Future wars, declares the Mission, will undoubtedly open with great aerial activity far in advance of contact either upon land or sea, and victory cannot but incline to that belligerent able to first achieve and later maintain its supremacy in the air. Great Britain, the mission reports, has come "to consider the dominance of the air as at least of equal importance with that of the seas and is frankly and avowedly planning a definite policy of aerial development to that end."

The report of the Mission is signed by Benedict Crowell, Assistant Secretary of War; Howard E. Coffin, member of the Council of National Defense; Henry C. Mustin, Captain, U. S. Navy, who signed with reservations; Halsey Dunwoody, Colonel, U. S. Air Service; James A. Blair, jr., Lieutenant-Colonel, General Staff, U. S. A.; George H. Houston, President, Wright-Martin Aeroplane Corp; C. M. Keys, Vice-President, Curtiss Aeroplane and Motor Corp., and S. S. Bradley, General Manager, Manufacturers' Aircraft Association. The Mission sailed for Europe May 22 and returned July 20.

In making the report public, Secretary of War Baker issued a statement emphasizing the thoroughness and value of the studies made with regard to the importance of aircraft and the essential dependence of the art for its development upon a sympathetic attitude in the Government. It is clear, Secretary Baker writes, that the ingenuity and ability of American engineers and inventors must be coordinated and our national effort freed from wastefulness and duplication. The Secretary did not, however, agree with the Mission that the solution lay in a single centralized Air Service.

The report of the Mission, with Captain Mustin's reservations, and Secretary Baker's statement, are herewith published in full.

Report of the American Aviation Mission

With Statement by Secretary of War Baker, and Memoranda 1 and 2 by Captain Mustin, U. S. N., Published in this Issue in Full

July 19, 1919.

TO THE SECRETARY OF WAR.

Sir:

In accordance with your instructions, the American Aviation Mission visited France, Italy and England. It was able to confer with various ministers of these Governments, ranking Army and Navy commanders, and the foremost aircraft manufacturers.

A thorough study and investigation was made by your Mission of all forms of organization, production and development. As a result of these studies your Mission desires to emphasize the universal opinion of its members that immediate action is necessary to safeguard the air interests of the United States, to preserve for the Government some benefit of the great aviation expenditures made during the period of the war, and to prevent a vitally necessary industry from entirely disappearing. Ninety per cent of the industry created during the war has been liquidated. Unless some definite policy is adopted by the Government, it is inevitable that the remaining ten per cent will also disappear.

In placing this matter before you the subject falls into three important heads:

(1) General organization
(2) Development, commercial
(3) Development, technical.

I. GENERAL ORGANIZATION.

The findings of the American Aviation Mission and its recommendations are submitted after a careful review of the situation in the allied countries mentioned, but always keeping in mind the situation in the United States. Under the above sub-heads the results of these investigations are presented to you, which, in the opinion of the Mission, demand the most earnest and immediate consideration along the broadest lines, with a view to establishing some fixed policy which will save the aircraft situation in the United States and give the United States an equal place with the great powers of Europe in this great new commercial development.

The American Aviation Mission therefore recommends *the concentration of the air activities of the United States, military, naval and civilian, within the direction of a single Government agency created for the purpose, co-equal in importance with the Departments of War, Navy and of Commerce, to be called in this report, for the purposes of identification, the National Air Service.*

In making the above recommendations, the following views and data of the Mission are presented:

Visits were made by the Mission to England, France, Italy and conferences have been held with those largely responsible for the successful prosecution of the war and especially with those men most experienced in the aerial development within those countries. Among others, interviews have been had with:

FRANCE: Maréchal Foch, Commandant-en-Chef des Armées Alliées; André Tardieu, Ministre des Affaires Franco-Américaines; Général M. Duval, Chef de Service de l'Aeronautique; Jacques Dumesnil, Deputé, formerly Sous-Secrétaire de l'Aeronautique; M. Loucheur, Président du Conseil de Guerre, now Minister of Reconstruction; Daniel Vincent, Deputé, formerly Sous-Secrétaire de l'Aviation; Gaston Minier, Deputé, Chef du Comité Aeronautique au Senat; and Major d'Aiguillon, of the Commission Interministerielle de l'Aviation Civile.

ENGLAND: Honorable Winston Churchill, M. P., Secretary of State for War and Secretary of State for Air; Field Marshal Sir Douglas Haig, Commander-in-Chief of the British Army; Admiral Sir David Beatty, R. N., Admiral of the Fleet; Major General Right Hon. J. E. B. Seely, Under Secretary of State for Air; Major General Hugh M. Trenchard, Chief of Air Staff, Royal Air Force; Major General E. L. Ellington, Director General, Supply and Research, Royal Air Force; Major General Sir Frederick H. Sykes, Controller General Civil Aviation, Royal Air Force; Sir W. A. Robinson, Secretary, Air Ministry; and Major General Sir W. S. Brancker, Royal Air

(*Continued on page* 10)

Delivery of Air Mail to Ocean Liner Successful

Aeromarine Flying Boat Piloted by C. J. Zimmermann Drops Pouch for Adriatic—Plan May Bring About Saving of Days in Voyage

The first air delivery of late mail for outgoing ocean liners was ingeniously accomplished August 14, when an Aeromarine flying boat dropped a pouch on the White Star liner *Adriatic*. The feat was successful despite adverse weather conditions and a heavy sea, an hour and a half after the *Adriatic* left port.

As a means of expediting the movement of overseas mail which misses the regular mail steamships, Otto Praeger, Second Assistant Postmaster General, ordered that the experiment be tried of dropping a mail bag upon the deck or in the water at the side of the *Adriatic*.

With the cooperation of David Lindsay, of the International Mercantile Marine, which operates the White Star line, Postmaster Thomas A. Patton of New York, through Daniel E. Jordan, assistant superintendent, division of mails, arranged with Inglis M. Uppercu, president of the Aeromarine Plane and Motor Co., to furnish a flying boat to carry the mail pouch from the Columbia Yacht Club, at the foot of West Eighty-sixth street, to a point well outside New York for delivery to the *Adriatic*.

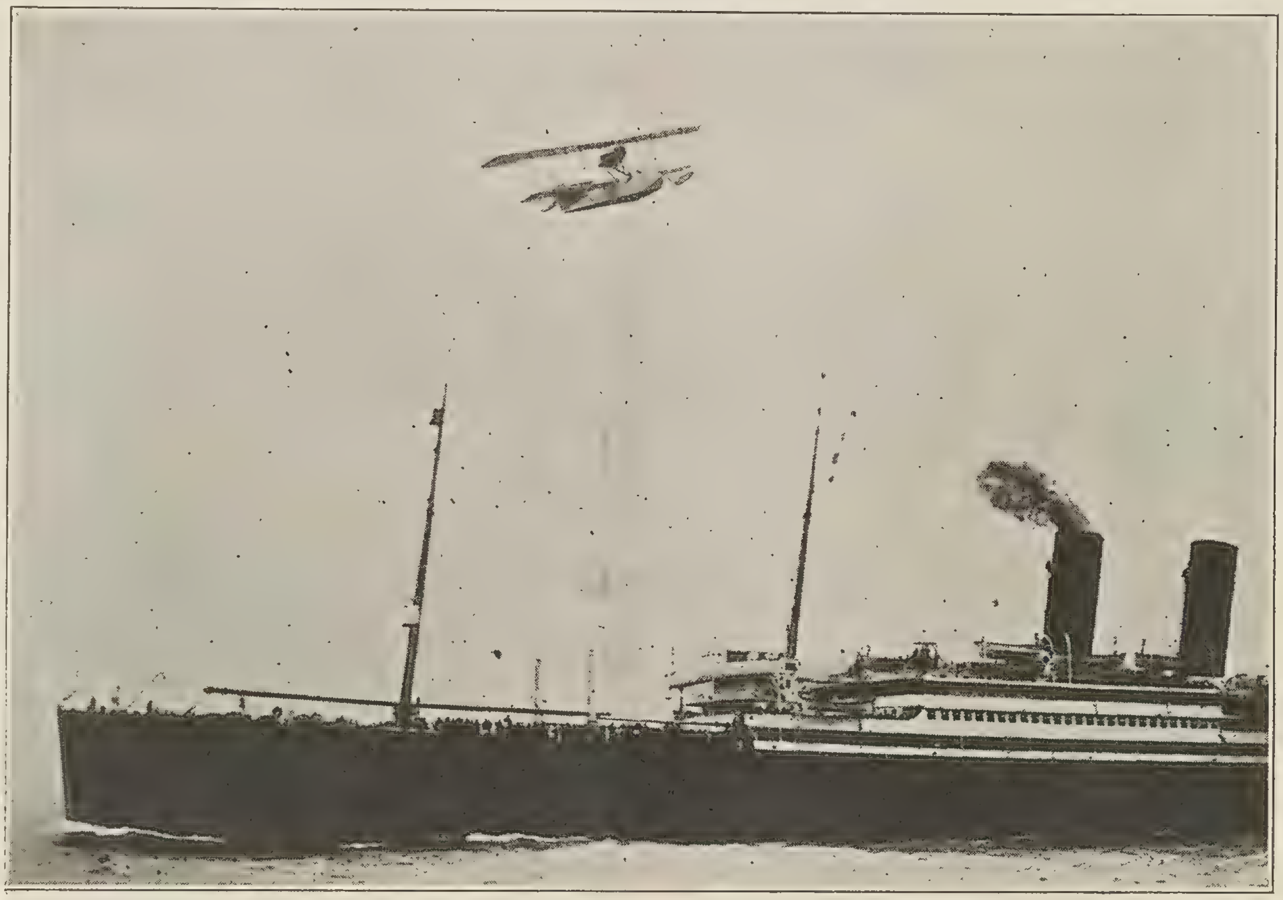
Leaving at half-past twelve o'clock, half an hour late, the *Adriatic* steamed at her usual speed through the maze of freighters anchored in the harbor and out through the Narrows. As the *Adriatic* turned her nose into Ambrose Channel the Aeromarine flying boat, with C. J. Zimmermann as pilot and Richard Griesinger as mechanic, which left Eighty-sixth street at half-past one o'clock, one hour after the departure of the steamship, appeared out of the mist astern and flew at a good speed at a high elevation over the steamship to a point well to the south. Swinging back toward the north into the teeth of the twenty-five-mile wind out of the north Zimmermann again flew over the steamship, this time at a much lower altitude.

Circling twice more, the pilot approached the *Adriatic* from the south at a low altitude, not more than fifty feet above the mast tops, and traveling at not more than forty-five miles an hour against the strong wind. As the plane passed over the *Adriatic* a specially devised weighted cable with shock absorbers was released, catching and wrapping itself around a cable which ran from the masthead to the deck. The mail pouch was pulled out when the cable contracted, dropping into the water. The pouch was then quickly hauled on board.

Placed inside a specially prepared outer covering, the mail pouch, brought up from the General Post Office, had been attached to the end of a flexible wire cable, two hundred feet in length and deposited in a veneer chute attached to the starboard side of the flying boat. The cable was coiled about a wooden spool at the upper end of the chute, which slanted downward toward the back at an angle of perhaps ten degrees.

The perfect performance of this experiment according to program was greeted by cheers and handclapping on board the *Adriatic* and Mr. Uppercu's private yacht, the *Lounger II*, on which, besides Mr. Uppercu and E. de B. Newman, secretary of the Aeromarine Plane and Motor Co., were representatives of New York newspapers watching the test.

Capt. Joseph B. Ranson, of the *Adriatic*, immediately sent a wireless message to the White Star office in New York telling of the success of the experiment.



Aeromarine Mail Flying Boat Over the Adriatic
N. Y. H. Service

The pouch used in the experiment was especially designed by the Safety-at-Sea Corp., of New York City. It was 16 in. high, 14 in. wide and about 3 in. deep at the base, weighing five pounds. The bag could carry about 400 letters.

The pouch is made of black rubberized material, the base of high gravity pliable rubber composition which keeps the pouch in an upright position when floating. With a reasonable quantity of mail the pouch will float about one-third out of water. The buoyancy is derived from kapok, with which the pouch is partly lined. The closure is effected by folding a flap in a certain manner and holding it with two straps and buckles. A padlock that is easily put on the pouch takes care of locking it, so that the contents cannot be interfered with.

Mr. Lindsay said after the success of the air delivery that the International Mercantile Marine was so pleased with the experiment that orders will be given at once for the delivery of manifests and other ship's papers and late mail to all of its outgoing vessels. It is expected that it soon will be possible to drop papers and mail to vessels several hours after they have left port, thus saving not hours but days in delivery overseas.

This is in accordance with the original plan of delivery, announced late in July by Mr. Praeger, which by the delivery of ship's manifests and other papers after the liner has left port would allow the saving of many hours and considerable money. The necessity of carrying manifests presents quite a problem to fast ocean liners, although this is circumvented in freight steamers by allowing manifests to be mailed on later, although, of course, faster vessels.

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One Passenger Record

A new world's altitude record of 30,000 feet is said to have been established for an airplane with passenger August 13 by Lieutenant Weiss, pilot, and Mechanician Begue, according to the French newspaper *Auto*. The flight, which took fifty-two minutes, was made at Villacoublay, near Paris. The aviators' instruments showed that they experienced a temperature of more than 25 degrees Fahrenheit below zero. The official figures on the ascent will be made public later.

Stowaway Punished

Ballantyne, the stowaway on the R-34 on the voyage to America, on his return to Scotland has been punished by the British Navy. He was not courtmartialed, but, placed before the officers, he was lectured on the danger he had incurred and informed he would not again be permitted to act as one of the airship's crew. He said he would have preferred a year in solitary confinement.

Special Canadian Stamps

The Postmaster General of Canada has issued 10,000 stamps of a special design for mail to be carried into the United States by airplane during the international air race of August 25 for the Commodore Hotel $10,000 prize and three trophies. This information came to the American Flying Club through Lieut. M. Leslie Hull, treasurer of the club.

What the United States Air Mail Is Accomplishing

Development of Commercial Aviation Subject of Address Before Convention of Dixie Overland Highway Association

By Otto Praeger, Second Assistant Postmaster-General

Good roads make for good transportation and good transportation makes for good mail service. That is why the air mail is the most wonderful transportation medium in the postal service. It is not hampered by bad roads. It sometimes gets bumpy up there where the postal aviators drive their mail through the air at 100 miles an hour, but it does not get so rough that the air mail does not come through.

A year and three months ago the regular airplane mail was launched with a little Army training plane out of Washington and another out of New York, each carrying 200 pounds of letters.

Today eight Post Office Department mail planes cleave the air daily, each carrying between 13,000 and 15,000 letters and traveling, rain, blow or shine, 1,900 miles each day.

It is astonishing how few people know—because they cannot realize it—that the Post Office Department is operating an airplane mail service daily in all weather and all seasons, between Washington and New York, New York and Cleveland, and Cleveland and Chicago. By reason of this service the Post Office Department is delivering the midnight New England and New York mail to the people in Washington on the noon carrier deliveries instead of the deliveries of the following morning. On the northbound trip we take the letter mail from the Seaboard Air Line and Atlantic Coast Line, originating in the southeastern States, and are delivering it to the people in New York City in the afternoon instead of on the following morning.

An airplane with 13,000 letters flies out of New York City at 5 o'clock every morning for Cleveland and Chicago, arriving at Cleveland before 9:30 a. m. and at Chicago before 1:30 p. m., advancing the mail to the Middle West sixteen hours and to the Pacific Coast twenty-four hours. From Chicago and Cleveland eastbound there is a similar expedition of mail to New York City and New England.

Second Assistant Postmaster General Otto Praeger
Photo Harris and Ewing

Since the air mail has operated it has covered 272,628 miles and has carried a total of 11,845,980 letters, and if Congress will give the money we will put the air mail next year from the Atlantic to the Pacific in forty hours instead of four days, and from Boston to Havana in a little more than twenty-four hours instead of sixty hours or more by railway and boat.

This is a bright prospect, but let us not deceive ourselves as to the practical possibilities of the air mail. The airplane service is not yet for every enterprising community that reaches out after it by offering landing fields and other inducements. The service, because the airplane up to this time has been developed for war instead of for commerce, is so costly that as yet it can be established only between the largest commercial and railway centers, where it can expedite the largest amount of mail to the largest number of people. The day will come, but it is not yet, when the air mail will operate between every important city in the United States. That will be the day when the airplane either can light gently on any ground like a bird, instead of gliding out of the air at a speed of fifty miles an hour, or when it will be so well powered by multiple motors that it will not become necessary to make forced landings, and, finally, when the Post Office Department succeeds in getting our manufacturers to build truly commercial planes that cannot crash to the earth in a tail spin.

Let us further clearly understand another thing: There can be no general extension of the air mail, nor a general development of commercial aviation unless Congress enacts legislation for the encouragement, development and national regulation of all flying, and makes carefully considered appropriations for the Army, the Navy and the Post Office Department.

With the meager appropriations at the disposal of the Post Office Department, enormous development in aviation has been made by the civilian organization that operates the air mail. Not only do we carry the mail between Washington and New York in two and a half hours daily instead of five hours by train, and in nine hours between New York and Chicago by airplane instead of twenty-two hours by train, but the Post Office Department has made scientific and mechanical contributions to aviation and has operated such a dependable service that European and American authorities have unhesitatingly pronounced the operations of our aerial mail far ahead of anything in the whole realm of aviation.

When the Post Office Department inaugurated the aerial mail, a delegation of military men connected with flying operations, called upon me, accompanied by a colonel of the British Air Force, to dissuade the Post Office Department from attempting to run a daily airplane mail schedule, on the ground that airplanes cannot be flown in rain or fog. But we operated the entire first year, scoring a performance of 92.73 per cent, despite weather and frailties of airplane construction. We are flying the mail daily across the Alleghany Mountains between New York and Cleveland, while the flying record of the Post Office Department between Cleveland and Chicago has never been equalled by aviators in any part of the world, whether military or civilian. The air mail distance between Cleveland and Chicago is 325 miles. This distance is covered daily each way in a nonstop flight with approximately 14,000 letters each trip, or 28,000 letters, weighing 800 pounds, a day. This great run has been made daily since May 15 without a single failure and, what is more remarkable, without a single forced landing from motor trouble of any kind.

The trips on this route, as well as on the New York and Washington route, have been made when visibility was less than 200 feet. In March our postal plane carried the mail to New York through a sixty-eight-mile gale with snow that tied up the shipping in New York Harbor, and the very next day we again carried the air mail into New York through a gale of eighty miles an hour, which velocity was recorded officially by the Weather Bureau at the very moment that our mail plane was making its way over New York City. On the Cleveland-Chicago run we scored 100 per cent each way in a storm that tied up shipping at both Cleveland and Chicago and in the recent terrific storm in Ohio and Indiana, in which two million dollars' worth of property was destroyed and eleven persons killed, we scored 100 per cent on the air mail trip in each direction.

In the year and a quarter's operation of the air mail only two aviators lost their lives in carrying the mail. Turn back to the files of the newspapers and see if they do not show that on an average two military or civilian fliers have been killed each week since the Armistice was signed. And yet there are some people who profess to believe that the Post Office Department cannot operate an airplane service.

Let me cite a few instances in which the Post Office Department has contributed directly to the advancement of aviation. We have demonstrated the possibility of maintaining a dependable daily schedule by airplane the year round despite the assurances of so-called authorities to the contrary. We have encouraged men with promising devices when no other branch of the government would lend them a helping hand.

Through the encouragement given an inventor by the Post Office Department an improved compass is now in general use by aviators. This compass is a significant departure from the early airplane compass which was hopelessly useless at times because of the great tendency of the compass card to set up a spinning motion. The first of this better type of compass was built specially for the air mail planes and was first used by the Post Office Department.

We encouraged an inventor, who got no assistance elsewhere, in the development of a self-cleaning spark plug and one which would not crack

(*Continued on page* 18)

A New Liberty-24

The War Department has developed a 24-cylinder Liberty motor which has just been successfully tested at McCook Field. Originally the Liberty motor was designed for eight cylinders, then enlarged to twelve cylinders. The engine used in the test at McCook Field was built of standard Liberty twelve parts. The changes were few, consisting chiefly of the use of two regular crank case upper halves, one of which was somewhat altered, and special design connecting-rods.

The following table compares the Liberty 12 and the experimental Liberty 24:

HORSE POWER (NORMAL)			
Liberty 12	673	Liberty 12	400
POUNDS PER H. P. (DRY)			
Liberty 24	1.97	Liberty 12	2.11
GAS CONSUMPTION (POUND) PER H. P. AN HOUR			
Liberty 24	.55	Liberty 12	.51

The experimental Liberty 24 compares favorably with successful tests of foreign motors of approximately the same power. An engine of this power, if run at the normal speed, would enable the use of a comparatively large slow-speed propeller without gear reduction, thus increasing propeller efficiency.

The following table compares the Liberty 24 and various high-powered foreign motors:

Motor and Country of Manufacture	H. P.
Dedion, France	800
Liberty 24, United States	*673–738
Fiat A 14, Italy	600
Rolls-Royce "Candor," England	600
Anzani 20, France	600
Renault 12-M, France	550
Salmson 18-Z, France	500
Napier "Lion," England	450

* Experimental, not rated.

Paris-London Service

Daily air passenger and baggage service between London and Paris will be inaugurated soon by the American Express Co., through its tourist department. Final arrangements for the service have virtually been completed, it is reported.

"The plan," said William Gourlay, the company's manager for the United Kingdom, "is to have facilities available whereby a man or woman can leave London in the morning, fly to Paris and transact business there, and return to London in time for dinner, and vice versa. The arrangements are in the final stages now with the British and French governments. We expect that customs officials will be posted at each end of the airplane route for the specific purpose of checking the baggage of arriving tourists.

"The ship will be installed and operating during October. There will be two grades of travel, both first class, one in an airplane carrying one or two passengers and costing approximately $100 for a flight one way and the other in a large air bus carrying fifteen passengers, for which the fare will be about $60 a person.

"We shall start with the air bus leaving three times a week and the airplanes daily.

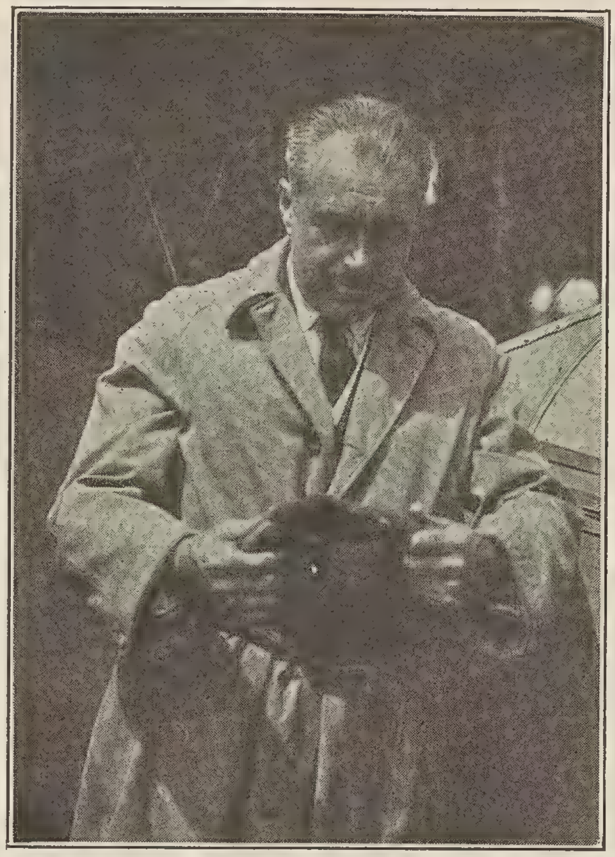
"Automobiles will convey passengers from their hotels to and from the airdromes, located respectively on the outskirts of London and Paris. The tickets issued will be after the style of steamships with a clause by which the passengers assume the risk for the journey. Each passenger will be allowed to carry a single piece of baggage, preferably no larger than a suitcase. Those going by airbus can travel in their ordinary civilian clothes, while passengers for the faster going airplanes will be supplied with headmasks and goggles.

"The minimum time for the journey will be three hours, while four hours will be the maximum period in the air. The present time by train and boat between London and Paris is nine hours and costs about $20."

Mr. Gourlay was asked if other air routes had been blocked out for regular passenger services. He replied: "Yes, before the year is out we shall have air planes meeting all arriving passenger ships at Liverpool and Southampton. Americans can see their heavy baggage through the customs into train vans and then board an airplane for London, going there long before dark and in ample time to obtain hotel accommodations so hard to get in the late afternoon."

Commuting by Plane

Finding that it takes nearly three hours to reach his office in New York from his home in Westhampton, L. I., Roy U. Conger of the United Aircraft Engineering Corp. decided to do his commuting by airplane and last week made his first trip. Leaving a field adjacent to his home in a Canadian training machine he arrived at the Sheepshead Bay Motordrome exactly one hour and seventeen minutes later. From there he reached his office by motor in less than half an hour. Mr. Conger returned to Westhampton by the same air route and expects to commute in this way so long as there is good flying weather.



ROY U. CONGER
Graphic News Bureau

Mathematical Consultation

Dr. T. Dantzig, Dr. G. A. Pfeiffer and Dr. J. F. Ritt, well known mathematicians, have established a firm for consultation in the application of mathematics to industrial problems. This is probably the first time such a firm has come into existence.

Redwood Aviation School

The Redwood Aviation School at Redwood City, Cal., has reopened after several months of inactivity, due to the enlistment of its pilots for war service. The Redwood School was the first on the Pacific Coast, and was established by Frank Bryant, a well known instructor in aeronautics.

During the school's operation more than 200 students were graduated without a single serious accident. This excellent record is said to be due to the school's insistence on all training being under the "Grass-cutter" System, so called in the United States. This system is known abroad as the "Roller" or French System, and was the exclusive training in France during and since the war.

School in Spokane

A $16,000 aircraft mechanical department is to be added to the plant of the Modern Auto and Tractor School, at Spokane, Wash. The department will teach the repairing and overhauling of airplanes and is to be in operation early in September.

C. H. Messer, vice-president of the Spokane school, is now at the Curtiss plant in Detroit to purchase a flying machine and the accessories to equip the new venture.

Equipment Warehouses

Owners of airplanes, as well as manufacturers and those individuals and concerns who are building experimental machines, will be interested in the announcement of the opening of warehouses in New York and Chicago for the distribution of high grade aircraft parts and equipment.

This new concern, the Aircraft Materials & Equipment Corp., has completed arrangements whereby they become distributors in the United States of spare parts for Canadian training planes, the machines used by the Royal Air Force in Canada for training purposes and of which several hundreds have been sold for commercial purposes throughout the country.

A large warehouse has been leased in New York at 1409 Sedgewick Avenue, where a complete stock of parts for engines as well as airplanes will be kept on hand at all times and a plan has been worked out whereby parts will be shipped the same day the order is received. This is done for the reason that these planes are used strictly for commercial purposes and owners must secure parts in the minimum of time to keep the planes operating every day. To facilitate ordering, a comprehensive parts catalogue has been published in which is listed every part of the Canadian Training plane and O.X.5 engine, both as an individual unit and also in the assembly in which it belongs.

A branch warehouse has been opened in Chicago with the executive office in the Westminster Building, and as soon as adequate arrangements can be made an additional warehouse will be opened in San Francisco, so that owners of airplanes whether they live in New York or a small town in Arizona, will be assured of efficient supply service.

M. W. Hanks, president of Aircraft Materials & Equipment Corp., has had wide and varied experience in all matters pertaining to aircraft work. He was in Washington during the war where he was in charge of aircraft specifications, Bureau of Construction and Repair, Navy Department. Before the war he was Standards Manager of the Society of Automotive Engineers and prior to that time was Western manager of the automobile equipment department for the Westinghouse Electric and Manufacturing Company.

The parts book mentioned above will be mailed without cost to those interested.

European Air Lines

A number of interesting announcements concerning the establishment of air lines in Europe have been made in conection with the Amsterdam Aeronautical Exposition held this month.

Vickers, Ltd., announced a combination of passenger and mail services which will help form the links of an aerial chain from England and France through Central Europe. The first service will be between London and Flushing by means of a Vickers flying boat. From Flushing, and in connection with the London service, there will be services all over Holland by Vickers-Vimy commercial airplanes to Rotterdam, The Hague, Mastricht, Amsterdam and Northern Holland. There will also be a circuit from London to Paris, Brussels and The Hague.

Another service in the preliminary stages will be started via Arnheim, Germany, to Central Europe, probably connecting with Berlin. There is a possibility that this service will connect with a Zeppelin service beginning at the end of August from Berlin to Friedrichshafen, connecting with Swiss steamboats on Lake Constance and landing at Munich on the way. For this a new type of commercial airship built since the war will be used.

The capital for the network of aviation services will be $5,000,000, partly Vickers' capital and partly taken in Holland. There is little Dutch competition, as the Dutch have practically no airship factories. They had no material for this purpose during the war and even most of the machines for the Dutch army came from Germany, the parts being put together here.

Complete organization of the new plans is expected to be ready at the beginning of 1920. Handley-Page, Ltd., has announced regular service between Amsterdam and London, beginning next week.

News of the Army and Navy Air Services

Army in Race

Major General Charles T. Menoher, Director of the Air Service, has announced that the Government would enter thirty airplanes in the handicap race between New York, Toronto and return, which is to commence Aug. 25. These machines will include almost every type of modern airplane of American, British, French and German make. They will be flown by United States Army aviators.

Although there are prizes totalling more than $10,000 for this race, put up by the Hotel Commodore, the Army pilots will not be allowed to accept any prize money in the event of winning. They may, however, compete for the three trophies offered for the race, General Menoher ruled.

The announcement of the Army entries was made by General Menoher to Laurence LaT. Driggs, president of the American Flying Club, 11 East Thirty-eighth Street, under whose auspices the race is being held.

The types of machines to be entered by the government were announced by General Menoher as follows: American make—De Haviland 4, De Haviland 9, De Haviland 9-A, Glenn L. Martin Bomber, Ordnance Scout, Honeymoon Express, Vought, La Pere, Thomas Morse Scout, 80-hp.; Thomas Morse Scout, 300-hp., and seven Curtiss J.N.-6H., all biplanes, and the Loening monoplane. British make—S.E. 5, S.E. 5-A, Avro and Bristol fighter. French make—Spad, Breguet. German make—two Albatross, one Fokker, three Pfalz, one L. Z. W. and one Hanoverian Scout.

General William Mitchell, who is to start the race from Mitchell Field, L. I., may fly one of the Army machines in the race himself. The trophies for which the Army pilots may compete are the Canadian National Exhibition trophy for the fastest time made on the round trip flight between the two cities, and the Canadian Aero Club's trophy for the fastest American entry in the race. The American Flying Club's trophy is reserved for the fastest Canadian entry.

The race will start simultaneously from New York and Toronto. The Prince of Wales will start the Canadian entries from the ground of the Canadian National Exhibition in Toronto.

160 Miles; 70 Minutes

More than two and a quarter miles a minute is the speed record made by Lieut. Lyman Paterson of the United States Army, flying from Washington to Langley Field. The 160 miles distance was covered in 70 minutes, according to an announcement made by the Air Service last week. It is pointed out that by maintaining this speed it would be possible to cross the Atlantic in considerably less than 24 hours.

Lumber Commended

A. M. Laird, general manager of the Potlatch Lumber company, of Latah county, Idaho, is in receipt of a letter from the United States Aviation Construction Department saying that the 148,000 feet of white pine airplane lumber cut, cured and shipped by the Potlatch Lumber company was among the best that the Government received.

The airplane lumber was cut from trees grown in Latah county and was sawed at the Potlatch mill. Only the "super cream" trees, as Mr. Laird calls them, were used. These were white pines from 200 to 300 years old, and the number of these found on 40-acre tracts of the company's best timber ranged from three to 20, and only the best part of the tree, sometimes only one or two logs, was used.

Pathfinders Off

The "All American Pathfinders" have started. The first plane of the squadron left Hazelhurst Field Aug. 15 on the first leg of the tour to San Francisco. The plane was piloted by Lieut. K. C. Leggett with Lieut. C. K. Guenther as observer. The fliers preceded the main squadron.

LIEUT. K. C. LEGGETT AND MAJOR O. M. BALDINGER, COMMANDER OF PATHFINDERS

(C) *Western Newspaper Union*

The remaining planes of the squadron got off by Sunday, when the last two Pathfinder planes left for Bustleton Field, near Philadelphia.

The Pathfinder tour is a campaign of education, as well as recruiting for all branches of the Army. It will show the public the actual working of an air squadron operating away from its base of supplies.

The detachment consists of twenty-two commissioned officers and eighty enlisted men. They will establish air mail routes, take photographs, build landing fields, and maintain themselves as if they were invading a hostile country. The heavier equipment of the caravan will proceed along the highways by twenty-seven motor trucks, seven automobiles, and motorcycle, engineer corps, and searchlight chassis.

Among the cities to be visited will be Philadelphia, Harrisburg, Pittsburgh, Columbus, Chicago, St. Paul, Minneapolis, Grand Forks, Fargo, Helena, Anaconda, Portland, Seattle, Tacoma, San Francisco, Los Angeles and San Diego. The pathfinders plan to take a southerly route coming back.

Britain Offers Prizes

The British government will offer prizes amounting to $320,000 for airplane competition in order to develop safer types of machines, Major General J. E. B. Seely, of the Air Ministry, announced in the House of Commons last week. The prizes will be distributed among three classes of aircraft—small airplanes, large airplanes and seaplanes.

Details of the competition will be announced shortly.

Aviators Ransomed

Two American Air Service officers, Lieut. Paul H. Davis of Strathmore, Col., and Lieut. Harold G. Peterson, of Hutchinson, Minn., who made a forced landing on Mexican territory Aug. 10, were captured by bandits and held for $15,000 ransom on threats of death. They were later released and guided the Eighth Cavalry across the border in pursuit of their former captors.

Lieutenants Peterson and Davis are a part of the personnel of the Fort Bliss Aviation Corps, but were on detached duty with the Big Bend district military headquarters at Marfa, Texas, when they disappeared. They left Marfa Sunday morning for the usual patrol of the border, planning to follow the north bank of the Rio Grande to the end of the district. The affair may lead to international complications.

Exhibition Flights

The Director of Air Service has been authorized to grant requests for airplanes for exhibition flights whenever possible, consistent with necessary activities of the Air Service, condition of material and the number and degree of training of the Air Service personnel, provided all expenses incident to such flights are assumed by the local authorities.

Glidden Offers Trophy

Captain Charles J. Glidden, organizer of the Glidden Automobile Tours, has offered a trophy for airplane touring to be known as the Glidden Airplane Efficiency Trophy. The rules of the competition will be published by the Aerial League of America.

Captain Glidden is publicity officer of the Air Service, but has been asked to be relieved as soon as his services can be spared. With the aid of the United States Weather Bureau, Captain Glidden arranged for the adoption of a weather forecast for air navigators which is sent out daily to all Air Service stations morning and evening.

Elizabeth Air Markers

Official air markers for the guidance of airmen piloting passenger and commercial aerial transports of the future over Elizabeth, N. J., will be located in Wilson Park, near the Newark line, it has been announced after a conference between Mayor Mravliag, Board of Works Commissioner Hand, Abe J. Davis, President, and Major D. Griffith, Secrtary of the Chamber of Commerce, and others interested in civil and city improvement.

The air markers as designed are three wooden or concrete structures, thirty feet in length, and will designate Elizabeth as Station J-78 on the air line route. These will serve as guides to direction and identification marks for the air pilots. The park will also be made available to the pilots as an emergency landing field.

Municipal Landing Place

"Spokane has been placed on the official air map of the Air Service as having a municipal landing place, the first Washington city to be so designated." In a letter to the aviation committee of the Chamber of Commerce Lieutenant-Colonel Hickman makes the above statement, further saying that a new Air Service map will be placed in the hands of the chamber as soon as it comes from the press. Spokane has a standing offer to provide a landing place for any coast-to-coast route.

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Formerly Air Service Journal

The American Aviation Mission's Report

THE report of the American Aviation Mission published in full in this issue contains the most important recommendation yet made in this country regarding aeronautical progress and deserves careful study by all interested in aviation. The list of foreign aeronautical authorities interviewed alone would attract to any report serious consideration. The mission was particularly well chosen as to personnel; all phases of aviation were represented and the scope of the report indicates that the widest latitude of investigation was encouraged.

The most important recommendation and the one which will arouse the greatest discussion is the unanimous decision that a separate Air Service is imperative.

The reasons advanced in favor of this plan are so conclusive that they will go far in convincing independent minds that a careful investigation can lead to no other conclusion. It is not to be expected that Army and Navy officials will take this advanced position immediately but experience abroad will no doubt exercise a helpful influence.

The emphasis placed on the future of commercial aviation is of tremendous importance. While Europe has gone ahead with large plans for the commercial conquest of the air, very little has been accomplished in this country. The interrelation between commercial flying and Governmental flying has not been given any serious encouragement in the United States due to the loose way all aeronautical agencies are organized. And American manufacturers are left to develop commercial aeronautics each according to his own plan without Government encouragement.

The desirability of having one large technical and experimental department has long been apparent. The greatest waste in duplication and the widest differences of opinion are caused by having a half dozen technical stations all trying to pass on similar problems.

The Mission's report will undoubtedly give Congress the information it desires to form a basis for constructive legislation for the Air Service of the future.

The Post Office Department's Record

THE summary of the achievements of the postal mail given by Mr. Praeger in this issue is a record of which the Post Office Department can well be proud. It proves that civilian management of Governmental aeronautical services can be successful.

It is unfortunate, however, that Mr. Praeger assumes that under a unified Air Service, the postal mail service will assume a military character. With a civilian Secretary in control of the service it would be unthinkable that the postal mail would be controlled by the military or naval officers attached to the service. All the work of the Air Service relating to commercial aeronautics should and undoubtedly will be in charge of civilians.

The Rigid Truss Monoplane

IT is interesting to follow the varying fashions—and this is the right word—in airplane design. In the secondary stages of airplane construction, the monoplane dominated the field. Then as engines employed grew bigger, and the supporting areas larger, the structural difficulties of a large wing surface led constructors to believe that the biplane was the only solution. The monoplane was generally taken to be structurally unsound and for some reason to be unstable.

Yet there is no reason at all why with proper proportioning of main tail surfaces, the monoplane should be any whit less stable than the biplane. A monoplane truss may indeed be slightly heavier than a biplane truss, but the weight is more than compensated for by decreased head resistance and simplicity of construction.

In the monoplane of present day design, there is also to be found the rigid truss, a simple pair of struts on either side doing duty for the complicated monoplane wire and king post system of early days.

The rigid truss system also leads to many advantages in the field, simplifying rigging and adjustment problems.

It is legitimate to note with some satisfaction, that while foreign constructors are now largely building the rigid truss monoplane, such as the Nieuport, the Sopwith Swallow and the Gordon, pioneer work in this direction has been carried on in the United States. As early as 1912 Grover C. Loening advocated this type of construction, and carried on development work persistently with the two seater 300 hp. Hispano-Suiza monoplane as a successful culmination.

Landing Fields

NO better work is being accomplished throughout the country than the progress that is being made in the establishment of landing fields. Even if the location of the field is all that is done, an interest has been aroused which will probably lead eventually to definite results. Every community that has its future welfare in mind will do well to give the subject of landing fields serious thought. Postal requirements, military and naval specifications and commercial possibilities all should receive consideration.

Handicap Contests for the Airplane

IN a contest to be run very shortly between New York and Toronto, provision has been made for a number of handicap prizes.

With a number of machines entering the race, belonging to a wide variety of types, there would appear to be considerable difficulty in giving a fair basis to the handicap.

One formula suggested was of the character

$$\left[\frac{\text{Useful load} \times \text{distance}}{\text{Horse power} \times \text{time}}\right] \times \text{Index Factor}$$

the index factor to be of such a character as to place all machines on a basis of equality. The first part of the formula is a fair indication of the fuel economy of the machine, but the index factor is a very indefinite and unsatisfactory quantity, for which the authors of the formula would themselves be hard put to find a definition.

It would seem better to employ the formula

$$\left[\frac{\text{Useful load}}{\text{Horse power}}\right] \times \text{Maximum Speed}$$

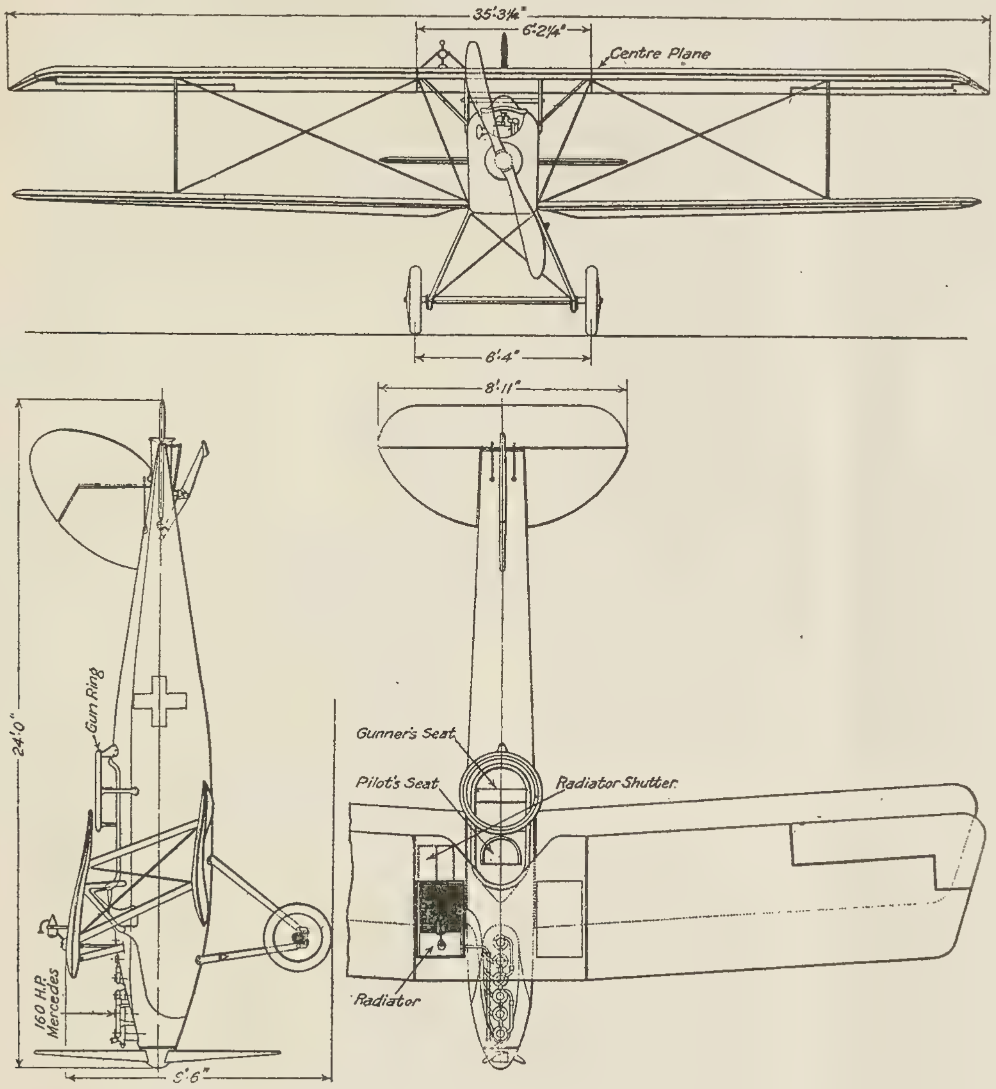
and establish this on the basis of the best information available for each type of machine.

If the formula is established for every machine entering the race, and the subsequent performance is used in the same formula, the ratio of actual values to the values originally established would perhaps be the best way of comparing machines. The percentage derived would be a measure of the reliability of the machine and the engine, and of the skill of the pilot.

The World's Airplanes and Seaplanes
Halberstadt Two-Seater Fighter

Group 2, Number 5

At the close of hostilities, the Halberstadt two-seater fighter was, in all probability, the best German machine of its type on the front. It was a day-bomber and reconaissance plane, and owing to its sturdy construction and good behavior in the air, it was well adapted for these purposes.



Outline Drawings of the Halberstadt Two-Seater Fighter

POWER PLANT

Mercedes 6 cylinder vertical type, 180 h.p.
Main fuel tank capacity, 24 gal.
Auxiliary fuel tank capacity, 8 gal.
Oil tank capacity, 5 gal.

MAIN DIMENSIONS

Span of upper plane	35 ft. 3¼ in.
Span of lower plane	34 ft. 11 in.
Overall length	24 ft. 0 in.
Overall height	9 ft. 6 in.
Chord of upper plane	5 ft. 3¼ in.
Chord of lower plane	4 ft. 3½ in.
Gap, maximum	4 ft. 0 in.
Gap, minimum	3 ft. 8½ in.
Dihedral of lower plane	2 deg.
Sweep-back of both planes	4 deg.
Area of main planes	310 sq. ft.
Area of each aileron	11.6 sq. ft.
Area of aileron balance	2 sq. ft.
Area of stabilizer	13.6 sq. ft.
Area of elevator	12.4 sq. ft.
Area of fin	6.4 sq. ft.
Area of rudder	7.9 sq. ft.
Area of rudder balance	1 sq. ft.
Load per sq. ft.	8.2 lbs.
Maximum cross section of body	8.8 sq. ft.
Horizontal area of body	44 sq. ft.
Vertical area of body	52.8 sq. ft.
Military load on test	545 lbs.
Total load on test	2,532 lbs.

PERFORMANCE

Speed at 10,000 ft., 97 m. p. h., 1,385 r. p. m.

	Min.	Secs.	Rate of Climb in Ft./Min.	Indicated Air Speed.
Climb to 5,000 ft.	9	25	440	69
Climb to 10,000 ft.	24	30	240	64
Climb to 14,000 ft.	51	55	80	58

Service ceiling 13,500 ft. Climb 100 ft./min.
Greatest height reached, 14,800 ft. in 64 min. 40 sec.
Rate of climb at this height, 50 ft./min.

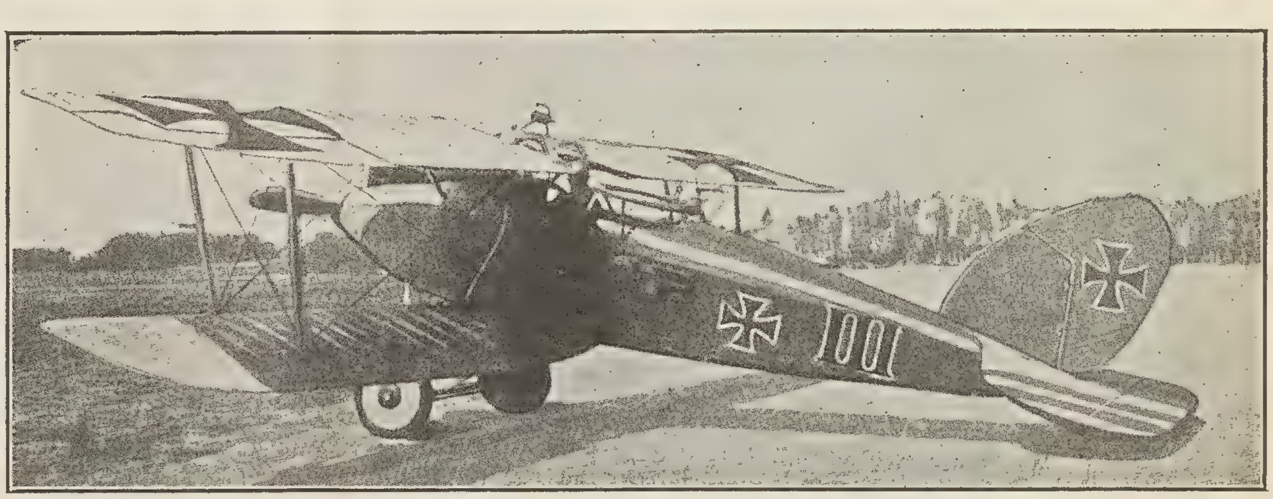
Structural Characteristics of Halberstadt Fighter—The wing construction is of considerable interest, especially the spar construction. The front spar measures 2¾ x 1 in. and is placed about four inches from the leading edge. It is of "I" section and is connected to the leading edge by means of plywood both top and bottom. The rear spar is built of two pieces so assembled as to form an "O" or box section. The internal compression members are not steel as is common practice, but rather box ribs placed at intervals along the spar.

The whole of the center section is covered with three-ply wood. The struts are of streamline steel tubing. They are not tapered at the ends, but end abruptly. This form of construction has the advantage of lending itself very readily to the saving of labor. The body is constructed with four main longerons fitted with skeleton bulkheads and covered with three-ply wood. A notable feature is that the pilot's and gunner's cockpits are made in one without apparently introducing any weakness in the structure.

The tail planes are of welded steel tubing and a fitting on the stabilizer permits adjustment on the ground. The ailerons are of welded steel tubing also. They are balanced and appear on the upper wing only. The ailerons are controlled by a rod which runs through the wing to the center section where it is connected, by means of another rod, to the control stick.

The landing gear is of conventional construction excepting the shock absorbers which are triple steel coiled springs. The tail skid is rubber sprung. The radiator is in one side of the center section, while the gravity tank is in the other. The radiator is equipped with shutters, which are within easy reach of the pilot.

The propeller has a diameter of 2.4 m. and a pitch of 2 m. The airplane is internally wired to give greater capacity for wireless, and accommodation is provided for the aerial and its spool in the observer's cockpit. The crew consists of a pilot and gunner. The machine is equipped with two machine guns, one fixed and synchronized with the propeller and one on a rotatable scarff.



Halberstadt Two-Seater Fighter

Writes Story in Plane

While in the air on a flight over San Francisco, Lieut. W. Edward Kilgore wrote a newspaper story of the flight and his experience, dropping it on the building of the *San Francisco Call.* The story was picked up and published in the *Call* while the plane was yet in the air.

Airplane vs. Railroad

Details of an unusual race between a De Haviland airplane and a railroad train have been made public by the Air Service.

The train made the distance from Sacramento to Minden in the Carson Valley, Nev., in thirteen hours. The airplane, piloted by Lieut. W. C. Goldsborough, made the distance in sixty-five minutes, thereby demonstrating that the flight could be made a dozen times by the plane in the time required for the railroad train to make the trip once.

Lieut. Henry S. Ormsby in a De Haviland made a new field record of 18,300 feet in sixty-five minutes at Mount Clements, the aviator finding the temperature freezing at this altitude.

(*Continued from page 3*)

Force, now with the Aircraft Manufacturing Co., Ltd.

ITALY: G. Grassi, Chief of the Italian Aviation in Paris; Colonel Guidoni, Italian Foreign Aeronautical Mission; Admiral Orsini, Chief of Italian Naval Aviation; Colonel Crocco, Chief of the Technical Bureau; and Signor Conti, Secretary of State for Aviation.

In all countries visited, and in the minds of all persons met in conference, appears an extraordinary similarity in condition and in conclusions drawn from the experiences of the five difficult years of mistake and achievement in the prosecution of the war. Perhaps no stronger or more simple presentation of the regard in which the future of aviation is held in allied countries can be given than by quotation from two letters of M. Clemenceau, copies of which were obtained in France. The first is addressed to the President of the United States, urging upon him the immediate consideration of matters aeronautical and in connection with the Peace Conference. The second is addressed to the President of the Republic of France, submitting the draft of a decree creating a separate department of Aeronautics placed transitorily under the Ministry of War—an intermediate step possible without legislation and looking to the early creation of an Independent Ministry of the Air:

LETTER FROM M. CLEMENCEAU TO PRESIDENT WILSON.

"February 16, 1919.

"The President of the Council, and
"The President of the Interallied Peace Conference.
"To the President of the Republic of the United States.
"Interallied Aviation Committee:
"Mr. President:

"I have the honor to acknowledge the receipt of your answer of February 7th, to my letter of January 24th. I enclose herewith, copies of the letters which I have received from Lord Milner and from Monsieur Orlando, as well as my replies.

"I am pleased to note that you agree in principle with my proposition to create an Aviation Committee for after the war. I take the liberty of insisting on the necessity of creating this Committee without delay, in order to be able to utilize it as an advisory organ for the Peace Conference. Indeed, the clauses for aerial protection seem to have at least an importance equal to the clauses for military and naval protection; and it is of the greatest interest to have a study made by competent personalities of the measures to take against the eventual constitution of a German military fleet. I cannot insist too strongly on the imperious necessity of this study, on account of the proximity of Germany to London, Brussels, Paris and Rome.

"Likewise, I adhere entirely to the British proposition which seems to me practical and effective, and I request you likewise to give it attention. In case it seems acceptable to you, I wish you would let me know if you could delegate two representatives to the next meeting of the new Interallied Committee, which will take place on Thursday, March 6th, at ten o'clock, at the Directory of Aeronautics, 260 Boulevard St. Germain.

"Please accept, Mr. President, the assurance of my highest consideration, etc.

(Signed) "CLEMENCEAU."

"REPORT TO THE PRESIDENT OF THE FRENCH REPUBLIC.

"Paris, June 6, 1919.

"Mr. President:

"Aircraft has developed considerably during the war. It should at this time adapt itself to a no less important part in peace time. But because of the many initiatives which cooperate in its new use and development, the efforts and means are dispersed in various ministerial departments.

"The future aviation in France will only be assured by the coordination of all efforts and the unification of the general services. Also, it will give the advantage of better work from the personnel and credits which are actually effected to similar objects in different ministries.

"With this object in view, and according to the propositions of an interministerial conference which I am able to assemble, I have the honor to submit for your signature, the following decrees creating an organ of general coordination of aviation.

"This should not be confused with any of the particular aviations of the various ministerial departments. At its origin, it will be attached transitorily to the Ministry of War.

"I am, Sir, yours respectfully,
"GEORGES CLEMENCEAU,
"President of the Council, War Ministry."

Even before the report of this Mission can be given consideration, a step similar to that proposed by France will have been taken by Italy. Here, however, the Department of Aeronautics is being placed under the Ministry of Transportation—a make-shift arrangement frankly acknowledged transitory and immediately possible without the legislation needed to create the clearly foreseen ultimate—the Italian Ministry of Air.

England more than two years ago began the coordination of her aircraft activities—an effort which has resulted in placing her well in the lead in practically every phase of aerial development and which has resulted in bringing her months ago to the establishment of a Ministry of Air, co-equal with her Ministries of War and of the Navy. That the present Ministries both for war and for air are centered in the same individual has no significance other than that of momentary expediency.

The whole trend of events touching the art of aeronautics in its broad relation to world progress, the experience in all Allied countries (including the United States) during the five years past, the frankly discussed future plans under present consideration in foreign quarters and the views everywhere encountered by us, leave your Mission impressed with these inescapable conclusions:

1. That Italy, France and England realize fully the importance of aircraft in the military-naval and civil-commercial aspects and propose to encourage the general development of the art through Governmental aid to commercial industry.

2. That Great Britain has come to consider the dominance of the air as at least of equal importance with that of the seas, and is frankly and avowedly planning a definite policy of aerial development to that end.

3. That any future war will inevitably open with great aerial activity far in advance of contact either upon land or sea, and that victory cannot but incline to that belligerent able to first achieve and later maintain its supremacy in the air.

4. That for economic reasons, no nation can hope in time of peace, to maintain air forces adequate to its defensive need except through the creation of a great reserve in personnel, material and producing industry through the encouragement of civil aeronautics. Commercial aviation and transportation development must be made to carry the financial load.

5. That no sudden creation of aerial equipment to meet a national emergency already at hand is possible. It has been proven within the experience of every nation engaged in the war that two years or more of high pressure effort have been needed to achieve the quantity production of aircraft, aircraft engines, and accessory equipment. The training of personnel including engineering, production, inspection, maintenance and operating forces—covering some fifty distinct trades and some seventy-five industries, has proved in itself a stupendous task when undertaken upon the basis of the war emergency alone.

6. That the rapid adaptation of aircraft to the commercial uses of peace is everywhere being studied and planned. Under the forced draft of war, this newest and fastest agency of transportation has been brought to a high state of development. It must now be redesigned to meet the progressive demands of a civilization at peace.

7. That because of its great speed and range of operation, oceans, states and even countries are being passed over with a greater facility than are townships and counties traversed by the motor car. The need for international agreements governing the construction, operation and safety of aerial apparatus of all kinds is immediately before us.

8. That for the first time in the world's history, the stage is set for a close international cooperation in the development of a great art at the very threshold of its era of commercial utility. Great Britain, France, Italy and Japan not only invite but urge the United States to share in this work.

9. That just as we now have National, International and Interstate regulations, laws and agreements covering rail and steamship travel and the safety and navigation of the seas, so must we have similar regulations governing aircraft and the uses of aerial navigation throughout the world. The International Committee sitting in Paris, under the Peace Conference, gives the first long step in this direction.

10. That the need in each country for a single authoritative point of contact for the conduct of all International aviation affairs, legal, operational, technical and political, is imperative. Such agencies have already been set up in England, France and Italy. The United States has under the terms of the International Convention no option but to follow these leads.

11. That in England, France and Italy sentiment is undoubtedly in favor of the centralization of aircraft development under one authoritative head. Difference of opinion has been encountered only in the matter of Army and Navy personnel and in the question of the Independent Fighting Force.

England holds the initiative and is building her Royal Air Force co-equal with the Army and Navy. France and Italy follow England's lead but seem inclined to leave questions of operating personnel for the present to War and Navy Departments, and to debate the need of an Independent Fighting Air Service. In all cases, forces operating in conjunction with Military and Naval units, function under the Military or Naval High Commands.

12. That among the many considerations of early moment requiring governmental direction may be mentioned the following:

(a) Federal and International laws governing the use of air routes.

(b) Federal and International control of pilots' licenses; examination and tests required.

(c) Federal inspection of all commercial aircraft for airworthiness, or suitability for service.

(d) Customs and other regulations for crossing State and National boundaries.

(e) International standards for methods of communication and signaling.

(f) International standards covering the marking or charting of air routes and of landing places for both day and night use.

(g) International specifications and rules governing the construction, equipment and operation of standard airdomes, landing stations, signal towers and other aids to aerial navigation.

(h) Port regulations and fees covering seaplanes.

(i) Federal taxation of aircraft and license for its use.

(j) Safety measures and devices; legislation forcing adoption.

(k) Fire underwriter standards, regulations and safeguards; insurance of machines, of material and of persons in transit (property and life).

(l) The legal status of privately owned aircraft; the property rights of the air; liability for damage inflicted and incurred.

(m) International standards and specifications covering accepted practice in quality of materials, in factors of safety, and in methods of construction; an engineering literature of this new art must be created by International approval.

(n) Maps and navigation charts of the United States and its territories.

13. That we of today are conceivably no more qualified to judge as to the scale and development of the aircraft of ten years hence than were we of even five years ago able to foretell the achievements of today. We must bear in mind always that for every one mind focussed upon things aeronautical in this earlier period, some thousands of keen minds are now versed in the aircraft art. With proper Governmental encouragement, rapid progress seems inevitable.

14. That the broadest consideration for the ultimate welfare of American aviation must be given in the constitution of any organization set up for the coordination and control of aeronautics within the United States. The prerogatives and ambitions of Governmental departments and of individuals must be assayed at true value.

15. That past experience and every economic consideration point to the vital need for the formulation by the United States, of a definite, comprehensive and continuing policy for the development of every phase of the aircraft art. Our Government is now faced with the task of nursing and actively encouraging a new transportation industry, whose healthy growth is vital to the future progress and defense of the nation.

Because of the lack of a definite, intelligent and sympathetic policy in our Governmental aircraft organization since the armistice, our American aeronautical industry, built up at such great expense of money and of effort, is rapidly disappearing. No sensible business man is justified in keeping money invested in the aircraft industry under the conditions which have maintained in the United States since November 11th.

16. That the closest possible relations must continually exist between the aircraft agency of the Government and the production and commercial industry engaged in aircraft development.

17. That the industries involved in the production and commercial use of aircraft must be given recognition and representation in connection with all national and international activities bearing upon the direction and control of aeronautics.

In the foregoing brief presentation of its conclusions, your Mission has touched upon the aeronautical policies already in effect or under present discussion in England, France and Italy. Great Britain's plan of organization certainly warrants our most careful consideration. Its salient points are clearly set forth in the chart herewith attached. It is not argued that the British method is perfect, but it can be stated without fear of contradiction in any quarter, that it stands today the most comprehensive governmental mechanism yet set up by any nation in the world for the encouragement, upbuilding, direction and control of its air resources. This organization has been born of five bitter years of trial, mistake, experience and progress. It is the product of the best brains in the British Empire focussed under the spur of national need and the demand of the British people. We in America may well study it carefully.

Your Mission, in presenting its recommendations, desires to emphasize the view everywhere encountered that the future of aerial navigation and of aerial development generally, is in only a limited sense a function of military and naval establishments. The air is a medium for commerce and communication and its direction to the peaceful uses of civilization must be unhampered by the necessarily restrictive views of these specialized departments.

RECOMMENDATIONS

A. The concentration of the Air activities of the United State, Civilian, Naval and Military, within the direction of a single Governmental agency, created for the purpose co-equal in importance and in representation with the Departments of the War, Navy and of Commerce.

B. That the agency thus created be charged with full responsibility for placing and maintaining our country in the front rank among nations, in the development and utilization of aircraft for the national security, and in the advancement of the civil aerial transportation and communication arts.

C. That this governmental organization be formed in general as follows:

1st. A civilian Secretary for Air.
2nd. An assistant secretary, a civilian, responsible directly to the Secretary for Air, for the management and operation of the Department.
3rd. Five or more Divisional heads acting as chief of the sub-departments of (a) Civil Aeronautics, (b) Military Aeronautics, (c) Naval Aeronautics, (d) Supply and Research, (e) Finance, etc.
4th. An Air Council, advisory in character, which shall be constituted by the Secretary of Air, including the Assistant Secretary of Air, the chiefs of the several sub-departments, and such other personnel as may be deemed advisable.

We desire especially to invite attention to the complexity and newness of the whole development of the aviation art, and to urge the broadest possible treatment of the subject during this formative period. We suggest that the lesser details of organization may well be left to the judgment and initiative of those called to assume the responsibility of directing this work. We desire also, in this connection, to call attention to the aircraft interests of the Allied Governments, and to emphasize the necessity for careful discrimination in the selection of men of industrial experience and broad vision.

D. The establishment of Governmental institutions of education and training, including an air college, all open alike under proper restriction, to military, civilian and naval personnel.

E. Such curricula and such arrangement of promotion in the National Air Service, and such assignment and pay as to insure to the young man an attractive career whether he elect to remain permanently in the "National Air Service" or return to Army or Navy, or to civil life.

F. The adoption of a system whereby Army, Navy and civil personnel can be circulated in proper proportion through the National Air Service. This personnel would, unless permanently assigned to Air work, be automatically returned to the Military and Naval sources, or to civil life as an Air Service reserve after the educational and service periods in the National Air Service have expired.

It is felt that such a circulating system is vital to the coordination and ultimate efficiency of the three services, and to the desired dissemination of a knowledge of and interest in the air among our people. The young officers of today will command the military and naval forces of tomorrow, and will carry with them into the highest ranks an intimate knowledge of aircraft, and of the strategy of its varied uses, in connection with operations on land or sea. The direction of civilian and commercial activities of all kinds will be made possible, and the closest contact and cooperation between the Government and the aeronautical industries assured.

All international relations touching aerial matters fall naturally within the jurisdiction of the Secretary for Air.

All responsibility for the supply of aircraft material and equipment of all kinds, and for the training of personnel for all branches of the service, is, in accordance with these recommendations of your Mission, placed with the Secretary for Air. As some twenty-seven thousand items are involved in the equipment and maintenance of each Air Squadron on active duty, the need for a single responsible direction seems undebatable.

Upon the plan of organization here recommended, all squadrons and all equipment assigned by the National Air Service to meet the stated requirements of the Military and Naval establishments, pass automatically under Army and Navy command. Under National Air Service operational direction, remain only those independent projects unrelated to the activities of the Military and Naval fighting fronts and such personnel and equipment as forms a surplus to the needs of the sea and land fighting arms.

The question of governmental organization for the development and utilization of our country's air resources has been given consideration by your Mission, seemingly from every angle. The recommendations made are general. No report could be made effective, if burdened with the mass of details involved in the setting up of any governmental mechanism such as proposed.

There has been, and will continue to be advanced many objections to the establishment of a Department of the Air. We believe none of them prove insurmountable. We believe the advantage gained to be such as to entirely overshadow any temporary difficulties.

Always in the past, in war by land or by sea, and in the transportation activities of peace, we have thought in two dimensions only. We must now readjust our minds to think for all future time in three.

When this Mission left the United States in May, its members thought the Atlantic Ocean might be crossed before January 1, 1920. Within three months of our absence, four successful crossings have been made and without the loss of a single life.

There must be no over-optimism. There are years of development and experimentation ahead. As in the case of all the other great agencies of civilization, the commercial and financially profitable use will come slowly. But here the immediate welfare and safety of our nation is involved and an intelligent and efficient direction of our aeronautical affairs will be demanded by the American people. American genius has given to the world the airplane, a new instrument of commerce and of war. But America has left its development to other nations, and too late, realized the mistake of this neglect. She has paid the price! America now again has the opportunity, if not to lead, at least to take her place in the front rank and to gain to herself the full benefit which will surely accrue from an active and sincere cooperation in the engineering activities, and in the scientific and commercial aircraft developments of those nations associated with us in the war.

But this will be impossible, in the future as in the past, if our aircraft activities remain dispersed among the several governmental departments and impossible of coordination for decisive action.

Upon the breadth of view and the vision of those in control of America's policies, depends our future as an air power.

II. COMMERCIAL DEVELOPMENT.

With reference to the commercial development of aviation your Mission makes its recommendation based upon the following conclusions which have been formed, first, through knowledge of conditions existing at present in America, and second, the knowledge gained by its investigations abroad.

The investigations in England included visits to a number of factories, airdomes and other points of particular interest, and interviews with the following gentlemen:

ENGLAND: Major General Hugh M. Trenchard, K. C. B., D. S. C., Chief of Staff, Air Ministry; Major General Sir Frederick H. Sykes, K. C. B., C. M. G., Controller General, Civil Aviation; Major General E. L. Ellington, C. B., C. M. G., C. B E,, Director General Supply and Research; General Huggins; Douglas Vickers, Vickers Co, Ltd.; Capt. P. D. Ackland, Vickers Co., Ltd.; Sir Percy Gerouard, Armstrong, Whitworth & Co.; Sir Samuel Waring, of Waring & Gillow, who is also interested in five other aeronautical companies in England; Holt Thomas, Aircraft Manufacturing Company; General Sir W. S. Brancker, K. C. B., D. F. C., Aircraft Manufacturing Co.; White Smith, British and Colonial Airplane Co.; J. A. Taylor, Cosmos Engineering Co.; Fadden, Cosmos Engineering Co.; Handley Page, Handley Page Co., Ltd.; Graham White, Graham White Co.; C. V. Allen, Secretary of the Society of British Aircraft Constructions; and Leslie P. Langton, Black and Manson Insurance Underwriters, who have specialized in aircraft insurance.

Members of the Mission also visited the airship factory of Armstrong, Whitworth & Co., located at Selby, and the dirigible airdrome of the British Navy located at Pulham, where they examined the R 33, which is a replica of the R 34, and several smaller airships.

The Mission's investigation in France included visits to a number of French factories and flying fields, and interviews with the following gentlemen:

FRANCE: Général M. Duval, Directeur du Service Aeronautique; Senateur Gaston Minier, Chef du Comité Aeronautique au Senat; Pierre Etienne Flandin, Deputé, formerly Chef de l'Organe Interallié de l'Aeronautique; Commandant d'Aiguillon of the Commission Interministrielle de l'Aviation Civile; Commandant de St. Quentin, Chef du Service de Fabrication de l'Aviation; Louis Breguet, of the Breguet Company and Compagnie des Messageries Aeriennes; Bleriot, of the Bleriot Company; Maurice Leblanc, Bleriot Spad Company; Kaherer, Société Astru; Bazaine, Société Nieuport; Maurice Farman, of the M. and H. Farman Company; Granet, Secrétaire du Chambre Syndicale de l'Industrie Aeronautique; Esnault-Pelleterie, Président du Chambre Syndicale de l'Industrie Aeronautique; Lieut. Réné Fonck, premier French ace; Maurice de St. Blanchard, Secretary of the Aero Club de France; and Comte de Libersee, former pilot and at present much interested in the development of civil aeronautics in France.

Among the factories visited were: Morane-Saulnier, Breguet, Bleriot, Farman, Hispano-Suiza and Renault, all of which are engaged in the manufacture of airplanes and motors.

The investigation in Italy included interviews by representatives of the Mission with the following gentlemen:

ITALY: G. Grassi, Deputy, ex-Chief of the Italian Aeronautical Mission in France; Colonel Guidoni, Italian Foreign Aeronautical Mission; Admiral Orsini, Commander of Italian Aviation; Captain Bursaglia, Chief of Staff to the Minister of Marine; Peroni, Director of the Ansaldo Co.; Casatti, of the Caproni Co.; and Buzio, of the Macchi Co.

Representatives of the Mission also visited the following factories in Italy, all of which are engaged in the manufacture of airplanes, balloons and motors: Pomilio Co., Ansaldo Co., at Torino; Caproni Co., at Milan; Isotta: Franchini, which was shut down due to a strike.

1. One of the most important problems to be considered in the rehabilitation of the world's commerce, following the close of the war, is the development of aerial transportation for commercial purposes. Its one invaluable service, and that in which it surpasses all other means of transportation, is speed, that time-saving element which the world has always striven for, and for which America, with its great distances, has such serious need. Reliability, safety, economy, and those other qualities of transportation service which are of value, will steadily improve as the use of aircraft increases and experience accumulates.

2. It is as impossible to forecast the future of this new medium of transportation as it would have been to describe the speed, comfort and safety of the modern steamship at the time the first steamship crossed the Atlantic. It is safe to say, however, that in time it will become one of the great transportation mediums of the world and will continue to offer the fastest and most direct means of transportation for persons, mail, and light freight, known to civilization. Its development is limited only by the perfection of the mechanical devices used, with which we are constantly becoming more familiar, and by the extent of our knowledge of the atmosphere which is becoming more thoroughly understood each year.

3. It is equally difficult to determine the speed with which this development will take place. In fact, this will be determined largely by the opportunities afforded to employ the brains of the engineer and the scientist on the problems involved, which in turn will be controlled by the financial resources available for such work. It is thought by some well informed authorities that the next five or ten years will see this new industry through its initial stages, and established on a self-supporting basis, providing it is encouraged at this time. Adequate support cannot be expected from private enterprise alone, and if no outside aid is given, ten years will probably see this industry in America still struggling for a foothold, and far behind its European competitors who will receive substantial aid of many kinds.

4. History has shown repeatedly that no nation can afford to neglect the highest possible development of its transportation mediums regardless of the opportunities existing for immediate profit to the private enterprise concerned. This is particularly true of aerial transportation, which is not local in its nature, but which is essentially of a national and international character, due to the great distances covered, and to the speed with which it links together far distant points. This principle has been so clearly understood that an International agreement has been established between the Allies and their associates, by which international flight of aircraft has been provided for in a far-sighted manner, thus making immediately possible the flight of private craft from one country to another on a basis as clearly defined by law as that governing the movement of steamships, except, of course, that the practice of ages of ship travel is missing in the case of aircraft.

5. The development of aviation is progressing so rapidly at this time that it is difficult even for those in close touch with it to keep up with its progress. During the past two months the Atlantic has been crossed four times by aircraft; first, by a seaplane of the American Navy, second, by an airplane of Great Britain, and finally, by an airship of Great Britain which has twice demonstrated its ability to fly between England and America. All of this has been accomplished without the loss of a single life. Airships are now building in England which will be able to carry from five to ten tons of mail, in addition to the necessary fuel and crew, and cross the Atlantic from London to New York, in one-half the time made by the fastest steamships. Who can say such transportation facilities will not greatly serve civilization, and be of immeasurable value to our own country if properly developed and used.

6. Already lines of aerial transportation are being used in England and France in a small way for commercial purposes, but the distances in these countries are so short that relatively little advantage can be gained, so such ventures will develop slowly. A daily service from London to Paris has been in operation for some time, and promises to be quite serviceable as soon as it can be relieved of its war time military supervision. Other lines now in operation are from Paris to Lille and Brussels and from Paris to various points in Alsace Lorraine and German occupied territory. Among other plans English private interests are projecting airplane lines from Cairo to the Cape and Cairo to Bombay, and French interests are planning to run a line to Algeria and Morocco. These lines will carry mail, passengers, and express, and it is expected that they will materially shorten the time between European centers and their far distant terminals. The United States Post Office Department has carried mail by airplane from New York to Washington for over a year with a record of nearly one hundred per cent delivery at each end every day. It is now inaugurating a line from New York to Chicago which will shorten the mail time between these two points to about one-half. It is also projecting a two-day service from New York to San Francisco. England is already desirous of organizing with the United States a trans-Atlantic airship line for mail service which would give a five-day mail service from London to San Francisco. Such a service is entirely possible at this time, and its inauguration depends only upon adequate encouragement and financial support.

7. The risks involved in these ventures, due to unknown conditions of the atmosphere, imperfections of equipment, etc., are still so great as to make them impracticable from the point of view of private enterprise, undertaken for a profit. If left entirely to such private enterprise, aerial transportation will develop slowly and with many losses and backward steps, as did the steamship, the railroad, and the automobile, each of which, however, has ultimately become a vital factor in our civilization.

8. One of the striking features of our investigation in Europe was the unanimous belief that the use of aircraft in warfare and for national defense would continue to increase and that in the next war, when-

ever it might come, aircraft would be a far more vital factor even than it has been in this war. One of the greatest military authorities in Europe stated that in his opinion the first battle of the next great war would be in the air, and would very nearly decide which side would win, in that the side winning in the air would immediately have access to all of its enemy's sources of supply and production, and would quickly cripple them by air raids upon an enormous scale. The opinion was everywhere expressed that the development of aircraft for purposes of national defense must continue and that sufficient flying and production facilities and personnel must be maintained at all times to insure an adequate supply in case of need. Due to the complicated and delicate nature of such equipment, to its rapid depreciation in use, and to its constant obsolescence, the expense involved in such a program would be very great, in fact almost prohibitive in peace times.

9. The existence of an aerial transportation industry with a great commercial air fleet and of a strong production industry would greatly decrease the need for strictly military equipment and resources in that practically all of the aircraft and landing field facilities and personnel, and the manufacturing and maintenance facilities and personnel employed by such commercial activities, would be available as a reserve in time of war. It is evident, therefore, that the most economical way to develop a strong air service for national defense is to encourage by every means possible the use of aircraft for commercial purposes, and thereby build up a commercial fleet at relatively small expense to the government, which would effectively supplement its strictly military equipment, in time of need. America's experience during the war has proven conclusively that aircraft facilities and personnel, and particularly production facilities and technical personnel, cannot be obtained upon short notice, but only by long and continued experience and at great expense.

10. America's production industry reached large proportions during the war, but since the signing of the armistice it has shrunken to a very small volume. Unless immediate attention is given to its conservation, it will practically disappear, and a considerable portion of the great sums expended in its development will have been spent fruitlessly. This industry does not require a large volume of business to keep it alive and healthy, but it does require a steady and dependable demand, otherwise private capital and enterprise will not long remain interested.

Recommendations

Upon the basis of these conclusions, we offer the following plan for stimulating the development of commercial aviation as an aid to national defense, and as a response to the demand that is already developing for improved commercial transportation through the use of aircraft.

A. The Civil Aviation Division of the Natonal Air Service should establish with the advice of the Army and Navy, and the Division of Military and Naval Aeronautics, a series of flying routes throughout the United States and its possessions and to contiguous foreign countries, which will be of military and commercial value. It should also prepare and publish maps and descriptions of each of these routes, suitable for the use of fliers.

B. There should be provided at national expense certain flying fields in strategic locations, and suitable for military purposes, and encouragement should be given to the various States and Municipalities to provide flying fields upon all flying routes, at points found desirable, thus eliminating the necessity for private ownership of flying fields except for strictly private use. Hangars should be provided at each flying field by the governmental authority owning the field (that is, Federal, State or Municipal), or where such fields are used constantly by private interests, they should be permitted to provide their own hangars immediately adjacent to and opening upon such flying fields.

The operation and use of such flying fields should be controlled by federal law, so as to obtain uniformity throughout the nation and conformity with international regulations.

C. All flying routes and flying fields should be equipped at national expense with signalling and communication systems, including wireless telegraphy, wireless telephony, and searchlights, to thoroughly safeguard and guide aircraft in flight. The Government's attitude in this matter should be the same as that maintained toward shipping in its lighthouse and coast patrol service. The operation of signalling and communication equipment should be controlled by federal law for the reasons indicated under item "B."

D. A meteorological service should be developed to provide fliers and other aviation interests with accurate weather reports and other atmospheric data necessary to govern their activities intelligently. The value of this service to commercial aviation cannot be overestimated as it will go far toward establishing reliability and safety of service, just as weather reports are of immeasurable value to ocean and lake transportation.

E. Training facilities should be provided at various localities throughout the country, either at Government expense, or by private enterprise under Government regulation, with guarantees from the Government of a sufficient number of students to cover expenses. Such guarantees could be given by the Government without undue expense if it used such schools for the preliminary training of its military personnel. Such a plan would encourage private enterprise to provide facilities for the training of the personnel needed for commercial requirements, which personnel in turn should become a permanent reserve for military requirements in time of need. There should be established at least one school for the teaching of aerodynamics and other branches of the science of aeronautics as recommended under the heading "Organization." Encouragement should be offered to universities throughout the country to establish departments of aeronautical science.

F. The Government should encourage the development of new design and aeronautical technique for commercial purposes along the lines recommended under the heading "Technical Development."

G. The Department of Aeronautics should maintain the closest possible relations with all civilized nations in determining and applying the rules and regulations which will govern the international use of aircraft, and there should be developed as rapidly as is consistent with proper consideration, a body of Federal law governing the use and airworthiness of aircraft for commercial purposes, which will safeguard life and property, and promote the commercial usage of aerial transportation. In order that commercial aviation may be helped and not hindered by such legal restrictions, it is of vital importance that aerial transportation be recognized at once as an element of interstate commerce and be made subject to one body of *Federal* law applying uniformly throughout all of the United States. It will thereby avoid the complications of individual state control which have proven to be such a handicap to railroad and automobile operation.

H. Insurance of aircraft and its personnel against all kinds of hazards and risks involved should be encouraged in every way. The cost of such insurance should be kept as low as is consistent with the risks involved.

I. Encouragement should be given to the organization of private enterprises for carrying on aerial transportation. This encouragement might well be in the form of payment for the carrying of mail and expressage, and of guarantees as to the volume of such business. Compensation might be paid to such enterprises for keeping their facilities available for use in time of war. Guarantees of this kind coupled with opportunity to insure against loss by accident should make privately operated transportation lines a commercial possibility, but if it is found that private enterprise does not respond to such encouragement, then the Government should undertake certain transportation ventures on its own account and should continue to operate such lines until they are proven commercially successful. Ultimately they should be sold to private enterprises on such terms as would permit of successful operation, as it is not believed that commercial aviation will ever be successfully developed entirely under Government control.

J. The remaining aircraft production industry should be conserved and kept in a healthy condition by a well defined and continuing program of production for military purposes, over a period of years. This policy should be continued until the commercial demand is adequate to support an industry of sufficient proportions to form an effective nucleus upon which can be built a war-time production in case of need.

III. TECHNICAL DEVELOPMENT.

With reference to technical development, your Mission in submitting its recommendations bases the following conclusions on a knowledge of conditions existing in the United States and upon extensive investigations conducted abroad:

(1) (a) The Mission visited plants making or experimenting in materials as follows:

France: Breguet, Farman, S. P. A. D., Bleriot, Hispana-Suisa, Moran-Saulnier, Renault, and Nieuport.

Italy: Ansaldo, Macchi, Caproni, Pomilio, Isotta (plant closed by strike), and F. I. A. T.

England: Handley-Page, B. A. T., Rolls Royce, Phonenix Dynamo, Bristol, Vickers-Vimy, Cosmos, Sopwith, Grahame-White, A. B. C., and Armstrong-Whitworth.

(b) The Mission has visited laboratory and experimental shops as follows: Institute Sperimentale Aeronautico, Rome; Eiffel Laboratoires, Paris; R. A. Factory, Fransborough, England; Isle of Grain Naval Experimental Station, England; Pulham Dirigible Station, England; Aeroplane Station, Contocelli, Italy, and Dirigible Station, Craspiano, Italy.

(c) The Mission has interviewed the following governmental official and industrial officers upon the subject of the proper organization, scope and equipment of the Technical Division:

England: General E. L. Ellington, Head of Department of Design, London, Royal Air Force; Sir Percy Herouard, Managing Director, Armstrong-Whitworth Co., 8 George St., Westminster, London; General Graves, R. A. F. Representative with British Peace Commission, Paris; General Brooke-Popham, Director of Research, London; Holt Thomas, London; Douglass Vickers, Vickers Ltd., London; Grahame-White, Grahame-White Aircraft Co., London; and Sir Samuel Waring, London.

France: Major d'Aiguillon, Interministerielle de l'Aviation Civile, Paris; Louis Breguet, Manufacturer, Breguet et Cie, Cie des Messageries Aeriennes, Paris; Cacquot, Former Chief Technical Section, Dept. Military Aeronautics, Paris; Colonel Dorand, Department Military Aeronautics, Paris; General Duval, Director Military Aeronautics, Paris; Jacques Louis Dumesnil, Deputy, Former Under-Secretary French Aeronautics; Captain de l'Estrade, Technical Service, French Military Aeronautics; Pierre Etienne Flandin, Deputy, Former Chief Inter-Allied Organization of French Aeronautics, Paris; Messaguer, Head of Hispana-Suisa Co., Paris; Maurice de Saint Blanchard, Secy., Aero Club de France, and Daniel Vincent, Deputy Director, Former Under-Secretary of Aviation, Paris.

Italy: Commander Caldara, Head of Aviation, Technical Section, Rome; Casati, Designer, Caproni Co., Milan; Lt. Col. Ferduzio, Designer of S. V. A. Rome Aeronautics, Rome; Colonel Crocco, Director of Institute Sperimentale; Colonel Guidoni, Italian Aeronautical Mission; and Admiral Orsini, Minister of Italian Aviation, Rome.

2. The form of technical organization and control recommended by your Mission differs materially from the controlling organizations in Italy, France or England. Inasmuch as, for some time at least, military, naval and departmental flying seems likely to lead in the development of the art, your Mission desires to lay emphasis upon the necessity of having these departments strongly represented in the operations of the Technical Division so that they shall be materially helped and not hindered in their research, experiment and development. To the same end, we are of the opinion that lighter-than-air, which in England at the present time is independent, can be best served by making it a strong sub-division of the Technical Division. In both England and France, due to the closeness of the war, the Technical Division is at present dominated by military personnel, but the opinion is unanimous that, as time goes on, civil personnel will supersede military in this division. General Ellington, England, expressed this opinion flatly and General Brooke, Popham, Director of Research, England, holds the same belief. In the Royal Aircraft Factory, at Farnsborough, civilian requirements are already overtaking military and naval. It has therefore been deemed wise to take the ultimate step at the outset in America, and a civilian head, of the type now earnestly sought in France and England, is recommended for America.

3. In equipment and personnel, England and France and Italy are maintaining their war strength in the Technical Division. At Farnsborough, we found a complete experimental plant, employing about 3,000 men and women, and carrying on actively nearly every line of research, experiment and development in motors, planes and accessories. More than a score of planes, rigged with apparatus for aerodynamic experiment, were in the hangars and in the field. Physical and chemical laboratories seemed busy and fully-manned. Estimating the lighter-than-air and the naval experimental and research personnel, it seems probable that the plant and the personnel engaged in the division in England is nearly, if not quite, equal to the entire trade in America at the present time. Obviously, this branch of aeronautics lies at the very foundation of the future, both military and civil, and to fail to bring it up to the standard of the world cannot help but mean dependence and mediocrity, or worse, in aeronautics in America.

4. The inclusion of such topics as armament (Ordnance), wireless (Signal Corps), instruments (Admiralty), photography (Signal Corps), design and bombs (Ordnance), etc., has been found necessary in all countries. In reality, the design and supply of such appurtenances is left to the departments or bureaus specializing in them, but research and experiment and development, in methods of installation and use is essentially a function of the Air Service Technical Division, and must be carried on by this Division, both in the laboratory, on the factory floor, and especially in the air, in the tank and on the field.

5. In all the European countries visited, we found that access to and use of the Government owned facilities for development is established. The basis of such use varies, and can be adapted to the circumstances. In all countries, however, the principle is the same, namely, that private interests must obtain access to Government facilities, through the officers of the Division, so that new inventions, etc., shall pass the scrutiny and criticism of the Division heads before going into actual experimentation. In England, an attempt has been made to furnish facilities at cost, but to save overhead, a schedule of flat prices is being worked out.

6. In England and France, the question whether or not to design complete motors and machines no longer exists. France was forced to design airplanes in 1916, due to the failure of her private firms to meet the crisis created by the Fokker; but the immediate result appears to have been a quick return to the safer measures for encouraging the private designers to design and build, under the direction and assistance of the State. In England, the complete design of airplanes ceased with the S. E. 5; and both Government officials and industrial officers offered ample testimony that the making of complete designs was a mistake and would not be repeated, due to its effect upon the private design departments. Without exception the manufacturers appear to take the view that it would be idle to compete by private efforts, if one division of the Government was designing and another division buying, as the Government would inevitably favor its own designers, even though not quite so good. The result of such a policy, therefore, would be to limit the number of sources from which useful designs can be obtained, and also to lower the standard of personnel in the design departments of private firms.

7. In 1918, Sir Arthur Duckham, then Director of Aircraft Supply for England, said:

> "As we all know, changes in design, unless they are actually for new types, may be absolutely against production; most of our delays in production in this country and in the countries other than ours, have been due to the effort to obtain too great perfection at too early a time."

Having this in mind, and having in mind also the disastrous effects upon production of similar causes in the United States, your Mission asked explicit questions concerning the plan used by the Technical Division in England to minimize the result of such changes. The method is outlined as follows:

> "All changes made necessary by the fact that a machine or motor is dangerous to the flier or to the public are classed as Number 1. These are imperative, and are ordered by the Director of Design, without delay. No machine is allowed to be accepted or flown without such changes having been made.
>
> "Important changes involving improvement in performance, etc., are classed as Number II. Such changes are made by order of the Modification Board described below, and became effective only at such time as not to interfere unduly with production.
>
> "Improvements and additions, not vital but often valuable, are classed as Number III. They are made when convenient, both to Government and to Contractor, and are not allowed to interfere with production or greatly increase price."

A Modification Board shall pass on changes and classify them. This board consists of five members, one from the Technical Division, one from Production, one from Operations, one from Finance and one from Supply. In the case of Number 1 changes, the Director merely reports that such and such changes have been ordered. All other changes are ordered by the Modification Board at regular meetings.

Your Mission is of the opinion that the establishment of some such uniform practice, covering not only such changes but also the method of paying for them, is essential to production; and should be a responsibility of the Technical Division.

Recommendations.

(a) That all technical functions of the Government in respect to aeronautics be centralized in a single Technical Division which shall perform the work for the Army, Navy and Civil aviation; and which shall be headed by preferably a civilian of wide executive experience. Such a division should include as Assistants to the Director, experienced representatives of Army, Navy and other Government departments interested in aviation, who shall be nominated by the departments and shall act as advisors upon the special needs of the Service they represent.

(b) That steps be taken forthwith to secure for the United States, the most advanced equipment for research, experimental and development work and for the testing of motors, planes, balloons, etc., for the testing of materials; for the examination and testing of aeronautical appliances, including armament and instruments; and that such an organization shall be established as shall assure at all times that the research, experimental and development activities of the Government shall be second to none.

(c) That the research, experimental and development facilities and equipment now used in aviation by the Army, Navy and other Government departments be inventoried immediately and put, as far as practicable, under the control of the Technical Division, retaining such of same as may seem suitable and bringing them under a central control to make a complete and efficient equipment, and discarding such of them as unnecessarily duplicate others or are out of date. In making this change, great care should be exercised to guard against measures which might tend to interfere with suggestions for improvements and advances in aviation, material and methods, coming from the operating aviation branches of the Army, Navy and Postal Departments. Experience has proved that the initiative in the advance of motors, planes and accessories often comes from practical experience in the flying field, rather than from the scientific department of aeronautics. The Technical Division will, in cooperation with the operating forces, study, work out and apply all such suggestions. Care should be taken also to avoid duplicating facilities already in existence, such as water tanks, armament testing grounds and many other items operated by existing departments. Arrangements should be made whereby the existing plants of this sort can be used, on a proper payment basis, by the Technical Division.

(d) That extreme care be taken in such a process of adjustment to provide ample means whereby the special technical needs of the (a) Army, (b) Navy and (c) Civilian flying shall receive attention. Means should also be provided whereby military and naval experiments of a secret nature can be carried forward.

(e) That the organization of the Technical Division cover by means of adequate personnel and equipment, all branches of aeronautical research, experiment and development, including the application and aerial use of instruments, armaments and munitions, wireless telephone and telegraph, bombs and fittings, sights, fire fighting apparatus, parachutes, air bags and other safety devices, motor appliances for air service, propellers and photography.

(f) That all the technical facilities of the Technical Division for aviation, whether now existent or to be created, shall be available to private inventors and designers, upon proper and reasonable terms.

(g) That in view of the experience of England and France, it is dangerous to allow the Technical Division to operate under normal or war conditions a department of complete design in heavier-than-air machines or in motors, as such competition results immediately in stopping private departments of design. The Technical Division, therefore, should be a critic of, and supplementary to, private design, rather than aim at design on its own account. The policy of the Technical Division should be to maintain and encourage a considerable number of well-manned and well-equipped private design plants and to cooperate with these plants in all undertakings that meet with the approval of the Technical Division, and to place orders with these plants, at fair prices, for design and for experimental construction of motors, planes and appliances. Competition of the government with the industry should be avoided; the only allowable exception being cases where, either on account of expense or for other cause, the Technical Division cannot obtain needed material or design from existing sources.

(h) That careful thought shall be given to the establishment of competition in motor, plane, balloons and accessory design, and encouragement be offered in every reasonable way to the promotion of competitive events and the establishment of standard records.

(i) That the Technical Division shall publish regularly and under competent management all the technical facts and data developed by the Division that may be helpful to the industry, reserving at the same time to itself the right to preserve secrecy in all matters that are deemed to be in the nature of Naval or Military secrets.

(j) That such a Technical Division shall maintain at all times, as close touch as possible with the development abroad and shall maintain representatives in Europe charged with the duty of liaison between the American and European technical organizations.

(k) That a definite method of payment for independent design, experimental production, changes in design, alterations and adjustments be worked out by the Government as quickly as possible, to the end that the design and improvement of motors, planes, balloons and appliances may be stimulated and not stifled.

(l) That the Technical Division shall include an Inspection and Testing Department, which shall carry on all inspections and tests of experimental construction and revision, and which shall issue certificates of air-worthiness for all machines for private and commercial use, and shall, from time to time, inspect all machines and appliances, including landing fields, signals, etc., used by public. In cooperation with the Civilian Division, this department shall have power to limit and control all types of air machines used in commerce, and to test such machines before they become production models. This department should have power to examine the inspection methods of all private concerns building aircraft, and to pass upon the quality of such methods from time to time.

(m) That close cooperation be maintained at all times with the purely technical aeronautical bodies, and also with the industrial bodies engaged in aeronautics, so that standardization of materials and practices may be carried forward as rapidly as can be done without hindering the development of the art or entailing undue losses upon the trade.

Respectfully submitted,
(Signed) Benedict Crowell,
The Assistant Secretary of War.
(Signed) Howard E. Coffin,
Member of Council of National Defense.
(Signed) Henry C. Mustin,*
Captain, U. S. Navy.
(Signed) Halsey Dunwoody,
Colonel, Air Service, U. S. A.
Assistant Chief, Air Service, A. E. F.
(Signed) James A. Blair, Jr.,
Lieut.-Col., General Staff, U. S. A.
(Signed) George H. Houston,
Pres., Wright-Martin Aeroplane Corp.
(Signed) C. M. Keys,
Vice-Pres., Curtiss Aeroplane & Motor Corp.
(Signed) S. S. Bradley,
General Manager, Manufacturers' Aircraft Assn.

Memorandum No 1.

Subject: Report of the Organization Committee, American Aviation Mission.

1. I concur with the report of the Organization Committee of the American Aviation Mission, to which I have affixed my signature, with the following reservations:

(a) Provided that the personnel employed in Naval Aviation operations shall be composed exclusively of officers and enlisted men of the Navy, Marine Corps, Naval Aviation Reserve, and where required for shore establishments, of civilians under the employ of the Navy.

(b) Provided that all advanced training of Naval Aviation personnel excepting advanced aviation engineering courses, shall be under the direct control and supervision of the Navy.

(c) Provided that when officers and enlisted men of the Navy, Marine Corps or Naval Aviation Reserve are detailed for duty with the proposed Air Department, they shall retain their naval or Marine Corps rank and ratings.

(d) Provided that administration and operation of all Naval Aviation forces shall be under the direct control of the Navy.

(e) It is recommended that the question of including in the proposed Air Department an offensive Air Force independent of the Army and Navy be left open, pending further investigation of this subject; and that the subject be investigated without delay by the Mission in conference with Army and Navy representatives, who have made a special study of military and naval strategy.

(Signed) Henry C. Mustin,
Captain, U. S. N.

Memorandum No. 2.

Subject: Report of the Development Committee, American Aviation Mission.

1. I concur with the report of the Development Committee to which I have affixed my signature, with the following reservation:

(f) Provided that nothing in the organization of the proposed Air Department shall restrict the Navy in the following activities:

(a) Maintenance of an organization adequate for the preparation of general specifications, general plans and characteristics of the aviation mechanisms, accessories, and equipment required for Naval purposes.

(b) Maintenance of an organization and facilities adequate for carrying on experimental aviation work of a class that is exclusively of a Naval character, and that does not involve duplication of efforts and facilities in the proposed Air Department that are common to other aviation branches.

(c) Maintenance of an organization and facilities for conducting the acceptance and tactical tests of complete aviation mechanisms and accessories.

(Signed) Henry C. Mustin,
Captain, U. S. N.

Secretary Baker's Statement.

In making public the report submitted to me by Mr. Crowell and his associates on the American Aviation Mission, I desire to emphasize the thoroughness and value of the studies made in England, France and Italy with regard to the importance of aircraft and the essential dependence of the art for its development upon a sympathetic attitude in the Government. Those best informed throughout the world are in accord in believing that this new agency of transportation has possibilities upon which it is now quite impossible to set limits. They are further agreed that we face a period, more or less brief, in which the prospect of commercial return is not sufficiently sure to justify private enterprise in developing the airplane industry into a self-sustaining position.

The importance of aircraft as a military arm is obviously so great that we must leave nothing undone both to develop the art in its scientific and practical aspects and to provide facilities for rapid quantity production in the event of emergency.

From these considerations it is clear that the ingenuity and ability of American engineers and inventors must be coordinated and our national effort freed from wastefulness and duplication.

The Mission has in my judgment gone too far in suggesting a single centralized Air Service. Army and Navy aviators are specialists in the art, both the airplanes and the pilots needed are of a different type from those needed in civil undertakings. The pilots particularly need to be trained upon a different theory. Military pilots are trained to fight singly or in formation, and to operate in coordination with other branches of the military service, so that their training must be military. Their own efficiency and that of the other branches of the service depends upon the most intense and constant associated training, and a separation of the Air Service from the Army or the Navy would require coordination of their activities in time of war whereas effectiveness in miltary operaton rests upon the concentration and singleness of authority, command, and purpose.

The point emphasized by the Mission is the importance of maintaining adequate production facilities in this country. This it is believed can be brought about best by the establishment of a government agency which will lay down the necessary rules, national and international, for aircraft operation, prevent discouraging lack of uniformity in state regulation and generally stimulate private and public enterprise in perfecting and using commercially this mode of transportation, and by centralizing the placing of orders on government account so as to have the incidental effect of making them contribute to the maintenance of aircraft production as an industry. It is not proposed, as I understand it, that great appropriations of public funds should be made for the establishment of uneconomic commercial air service routes, but obviously an extension of our air mail service could be made and it could be further extended as the perfection of machines advances and their reliability of service is more and more established. Such encouragement as the Government may find it wise to give can be accomplished without sacrificing the science of military aeronautics. The Joint Board of the Army and Navy is already eliminating duplication and producing cooperation in developing the air service of those departments, and should Congress decide to extend its aid to the commercial development of aircraft, complete cooperation will be easy in all matters of invention, design, and production where the different aspects of the problem meet on a common ground.

(Signed) Newton D. Baker,
Secretary of War.

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*Note: Subject to Memoranda 1 and 2, July 19, 1919.

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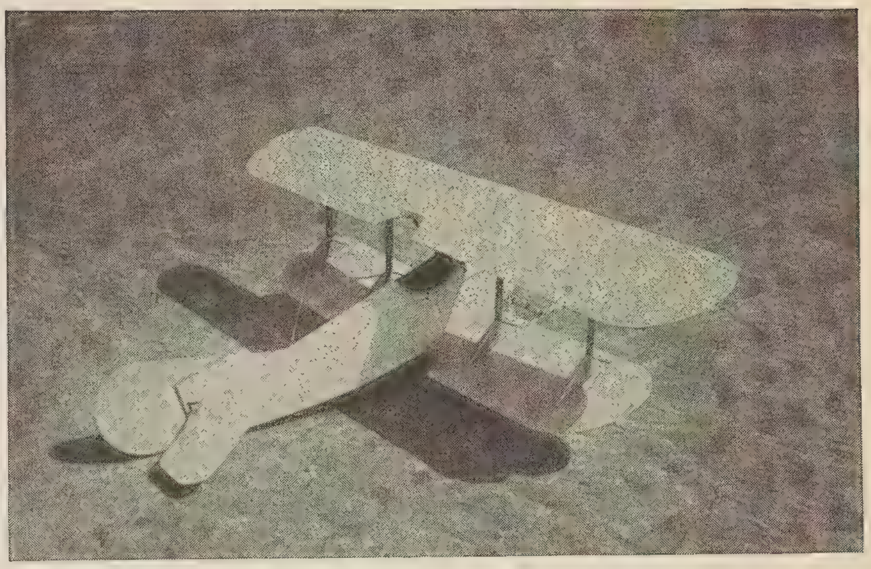

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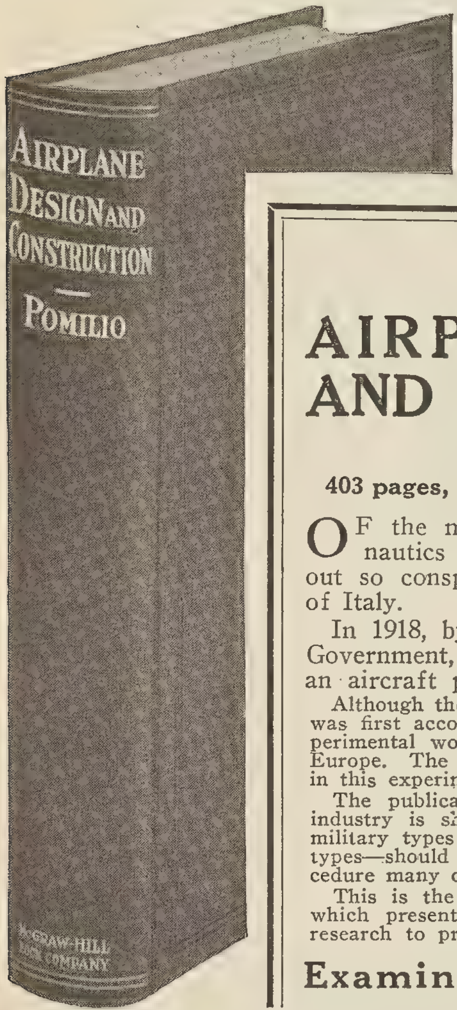

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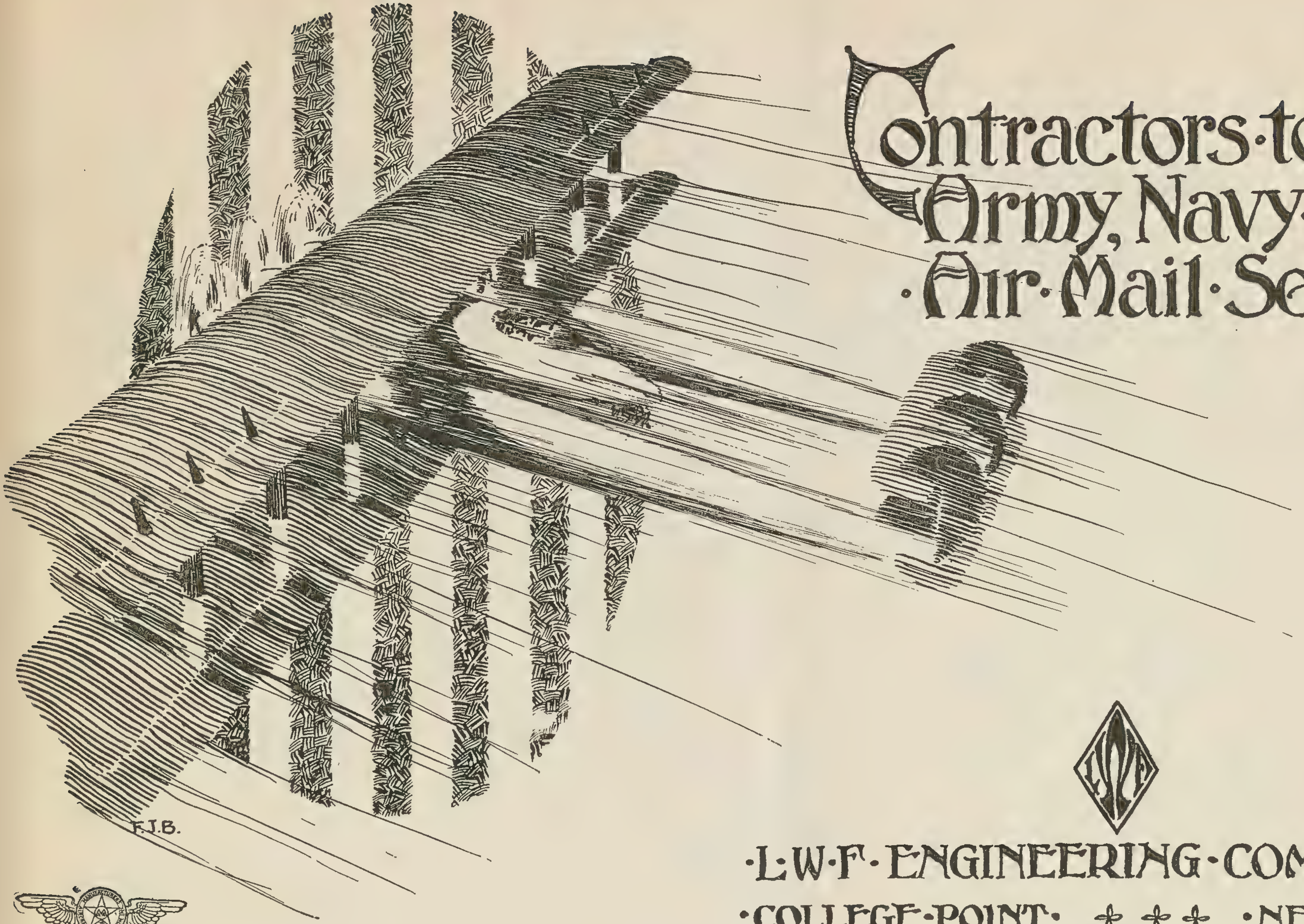

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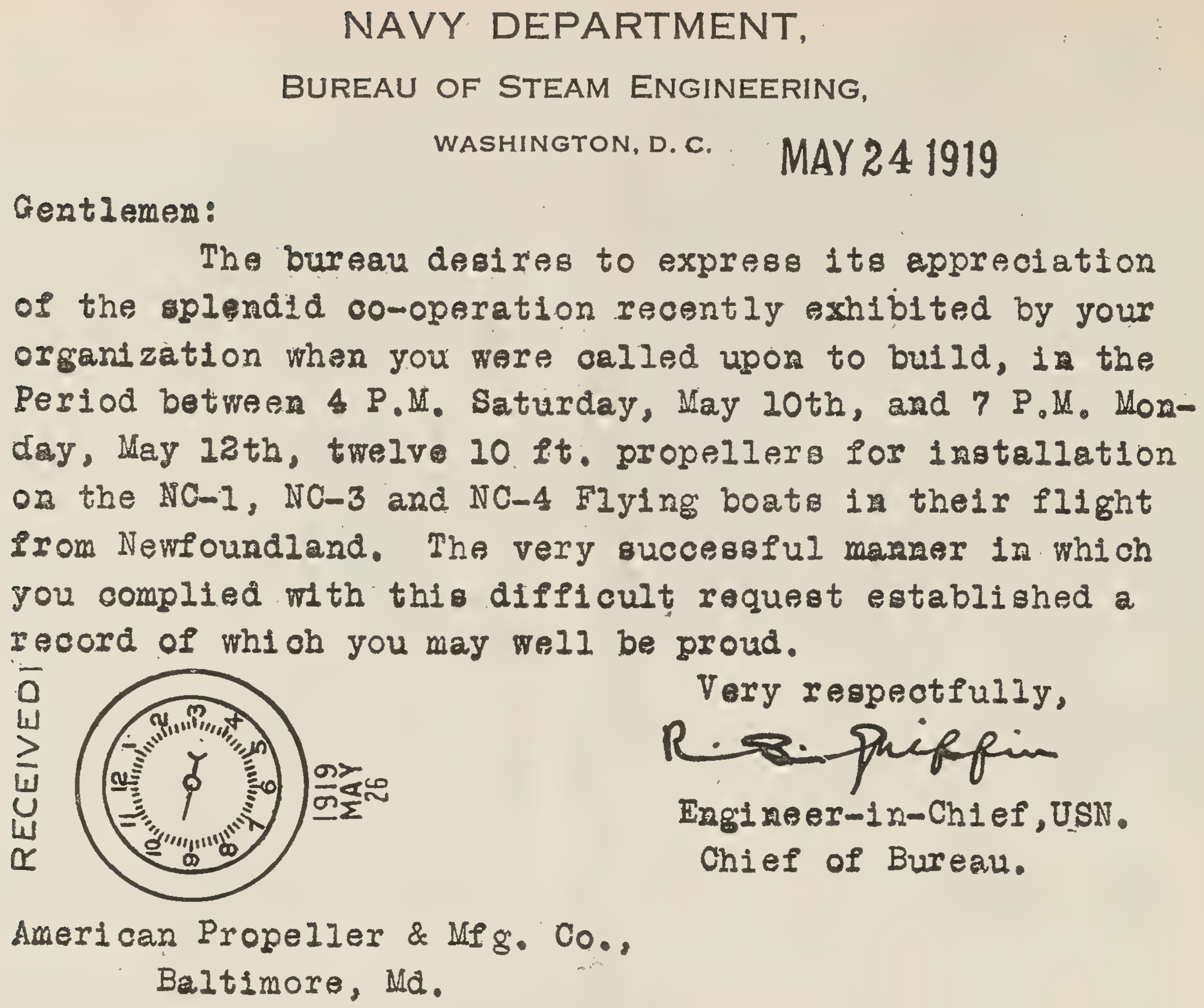

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Engineer-in-Chief, USN.
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The U. S. Air Mail

(*Continued from page* 5)

or fuse in a high compression Liberty motor. That type of plug was developed on the air mail field at Washington and tried out and perfected on our air mail planes. There are several makes of such plugs now on the market.

At the request of the air mail service the Bureau of Standards started to work on a device to locate or spot accurately a landing field by sound at times of utter invisibility and that Bureau has invented and perfected a device that will enable an aviator blind-folded to locate unerringly the center of the field on which he is to land. This wonderful achievement of the Bureau of Standards has been accomplished on our air mail field and with the air mail planes.

It may be interesting to note that so close has been the cooperation between the Navy and the air mail service that the most efficient and modern radio direction finder in existence today and used by the Navy in its transatlantic flights, was first installed in an air mail plane and tested out in the radio test plane of the air mail service in Washington.

The gyroscopic turn indicator—a wonderful device for showing a pilot in fog or rain instantly whether his plane is turning right or left from its course or straight line of flight—was given a thorough service test on the air mail planes and is being improved in some essential respects as a result of our suggestion in cooperation.

The first cross country flights with a new alcohol fuel were made in the regular New York-Washington air mail runs.

The instances of direct and indirect contribution by the air mail to the development of aviation could be enumerated at still greater length, but I will cite only one more case. It is the story of the De Haviland-4 airplane as manufactured in this country for our fighters in France. The construction of this plane was not suited to commercial work. On a rough landing these machines continually wrecked, and a De Haviland turning turtle usually resulted in the breaking of the fuselage of the plane into kindling wood. The Post Office Department had a number of these planes rebuilt and so successfully strengthened that they may now turn turtle with the same impunity as any other strongly constructed airplane.

Another and most promising change which the Post Office Department has made in one of these rebuilt De Havilands has been the conversion of such a plane into a twin-motor machine capable of carrying 600 pounds of letter mail. This experimental plane, temporarily equipped with two Hispano-Suiza 150-hp. motors, makes 103 miles an hour with both motors and 80 miles an hour with one motor. It has a landing speed of less than forty miles an hour. Two six-cylinder 200-hp. motors of the Liberty type will be installed in this plane and there is every reason to believe that it will surpass in performance the single motor twelve-cylinder Liberty planes of this type now operating between New York and Chicago.

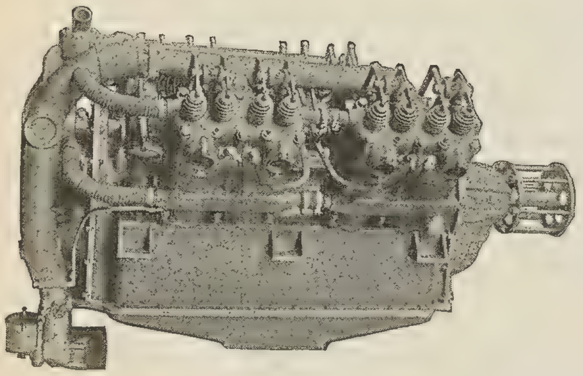
Furthermore all of the planes in the air mail service are being made safe against fire by completely isolating the engine and gasoline compartments by asbestos fire walls, each compartment protected by pressure fire extinguisher system, and the mail itself is being safeguarded by non-inflammable canvas bags.

Yet in the face of all the forward steps taken and the unparalleled flying record of the Post Office Department, Congress is being asked to take from this Department the operations of the air mail on the ridiculous theory that a civilian organization cannot know anything about flying and—just think of this—on the assumption that the Post Office Department cannot operate a separate air mail service as economically as it might be operated by a military organization. An investigation of the cost of military flying as compared with the cost of the air mail operations will settle that contention conclusively.

You have heard something about an Air Ministry, or a unified air service. The question whether military aviation activities should be under one control by combining Army and Navy Air Services is a question that should be determined by the best military judgment, but the advocates of a unified Air Service go much further than proposing merely to unify military aviation. They want to militarize all other aviation, including the air mail of the Post Office Department. Their proposed unified air service is a military service pure and simple, operated by generals, colonels, majors, captains, lieutenants and enlisted forces. They are not satisfied with letting the military develop and perfect military aviation, which in itself is a man's size job, but they want to fasten military control on the operations of the commercial aviation of the Post Office Department. There is as much sense in a military air service operating the commercial air mail of the Post Office Department as there is in the Motor Transport Corps of the Army operating the Post Office Department's motor truck service in your cities and on your star and rural routes.

I am well aware that there is on foot a strong propaganda in favor of a unified air service, which is to conduct the non-military as well as the military aviation of the Government. This campaign is being engineered by persons who imagine that the airplane industry of the country cannot exist unless kept up by military contracts. No one knows better than the aircraft builders that in the long years of peace ahead of us, commercial aviation will far outstrip military aviation, and that no greater obstacle can be thrown in the way of commercial aviation than to subordinate it to military control.

Such is the situation in aviation today, but let us not forget that whatever may be the check to commercial aviation in the United States through unfortunate legislation or lack of appropriations, commercial aviation has arrived and it cannot be stopped. We may retard its development in this country by listening to unwise counsel, but in the course of years it will come to us in spite of ourselves, because if we fail to hold the lead we now have other countries will take it from us and in the end we will have to follow.



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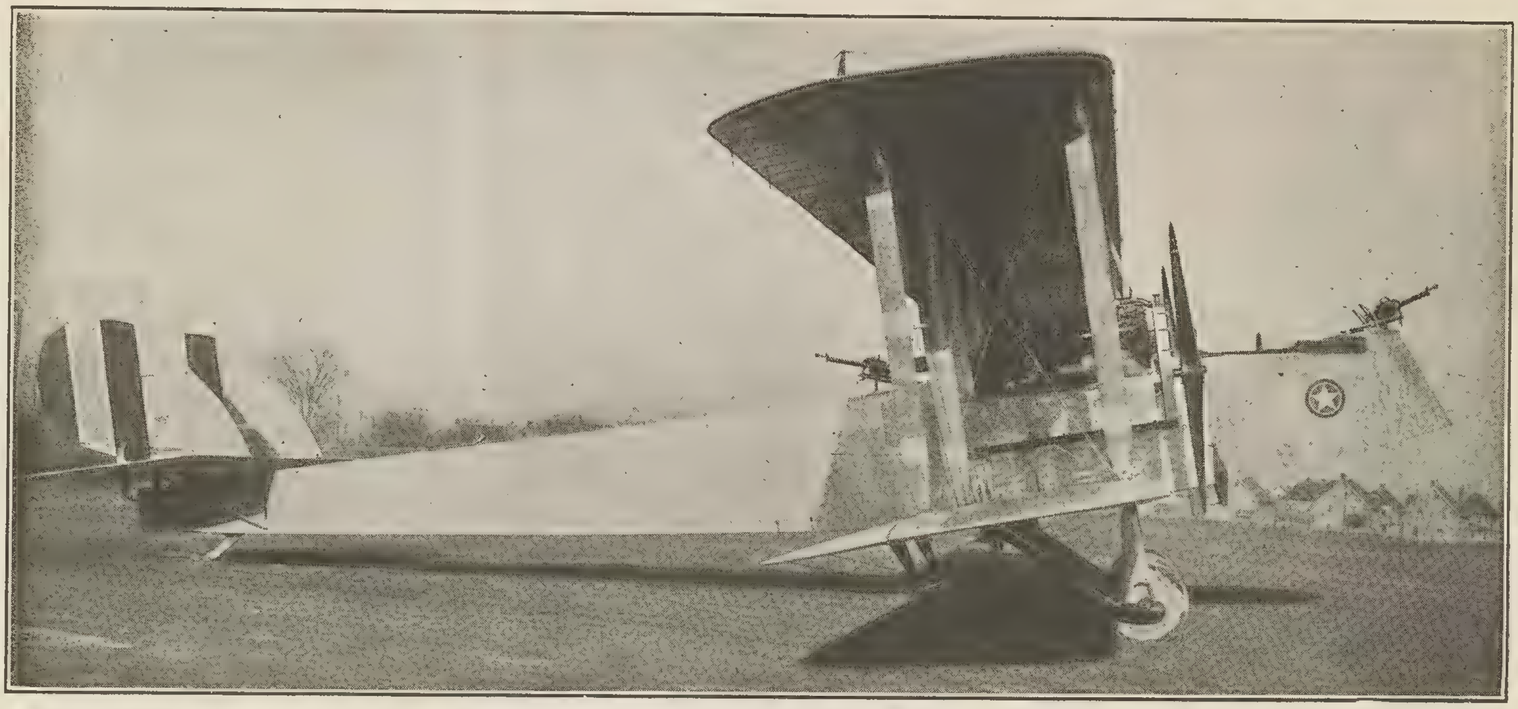

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Major Schroeder and Lieutenant Plumb First to Finish Aerial Derby Circuit

The international handicap race between New York and Toronto, begun August 25, was enthusiastically contested by more than forty aviators, despite thunderstorms, showers, rain, and fog at both ends of the course as well as throughout its length. Notwithstanding the discouraging conditions, 39 planes hopped off Monday, 12 from the Canadian terminus and the remainder from Long Island, and night found that 32 of them had reached Albany.

Three fliers made the trip one way the first day, all starting from Toronto and landing at Roosevelt Field within ten minutes of each other. The weather on the Canadian side during the late evening and night was gusty and rainy and none of the New York starters reached the Leaside airdrome.

By midnight of Tuesday, three American aviators had completed the round trip, with the prospect that many more would not be far behind, for the uncertain weather conditions made it probable that the race would not be completed for another twenty-four hours at least. Several, indeed, that had met with minor mishaps, returned to their starting point, made repairs, and set forth again.

All during the early days of the week, Roosevelt Field resembled the pits at an automobile race, magnified a thousand times. Mechanics swarmed everywhere, hammering, tinkering, readjusting the wings and tuning engines on the planes. The air was continually filled with the roar of motors and the cheers of onlookers greeting arrivals or shouting farewell to departing fliers. Most of the machines soared up with a mighty burst of noise and droned away northward. A few encircled and then dropped to the field again for further repairs. One or two came wabbling back from upstate, for new parts and another start in the race.

The same was true, in a lesser degree of Toronto and the control stops at Syracuse and Buffalo.

Considerable difficulty was encountered at Albany, where the flying field was far too cramped and small to accommodate the fliers coming to it from two directions. Several machines met disaster at this point, where inefficient policing of the crowds coupled with a far too generous distribution of trees made landing quite a hazardous proposition.

The contest, the greatest of its kind ever held, was under the joint auspices of the American Flying Club and the Aero Club of Canada, and the test consisted of a return trip between New York and Toronto, with three control stops between the starting points: Albany, Syracuse, and Buffalo where each machine must remain at least thirty minutes.

The contest was for speed and handicap. In and an able rival of the great London Derby, the speed test the machine making the return journey in the shortest time, regardless of conditions, was to be declared the winner. In the reliability test, each machine virtually raced against its own ideal performance, the formula

$$\frac{\text{Useful Load}}{\text{Horsepower}} \times \text{Speed}$$

being used to determine the ratio of the actual performance made to the ideal performance. The ideal performance was based on official and Government tests only. Prizes amounting to $10,000 offered by John McE. Bowman, and trophies offered by the American Flying Club and the Aero Club of Canada will be awarded.

Among the machines entered in the 1,042 mile race were some of the following types: SE-5, Martin Bomber, Le Pere, De Haviland-4, De Haviland-9, De Haviland-9A, Vought VE-7, JN-4H, Spad, Thomas-Morse, Caproni, SVA, L-W-F Shark, L-W-F Hispano, Avro, Curtiss Oriole, Canadian Training Plane, Curtiss Wasp, Sopwith, Fokker. The official entries numbered 57, 43 of which were to have been started from New York.

As contestants were given two days in which to complete the return flight, under the Rules and Regulations of the flight, and as pilots were to be allowed credit for delays due to unreasonable weather, it is impossible to print complete results of the race in this week's issue of AIRCRAFT JOURNAL, which went to press at a late hour Tuesday evening. Full results will appear next week.

When this issue of AIRCRAFT JOURNAL went to press, the following flights had been reported:

Lieut. M. J. Plumb was the first flier from New York to reach Toronto and as well first to complete the round trip. He piloted a De Haviland-4 engined with a Liberty and carried Sergt. Ralph Kratz as observer. The crowds at Roosevelt Field broke into cheering that almost drowned the roar of the motors as Plumb's plane *Phoebe* swooped down to earth. Hundreds ran toward her before the propellers had stopped turning in their enthusiasm to greet the first arrival.

"We were about thirty miles out of Syracuse," said Lieutenant Plumb, "when the exhaust pipe broke off. Immediately the pressure in the gas tank began to mount. It had reached nine pounds by the time I was able to turn the controls over to Kratz. I took a monkeywrench and climbed up to the tank where I loosened up the pressure until it was down again to the normal three pounds. But for a minute we were in a pretty bad way and once she sideslipped badly."

The time of the *Phoebe* as given out was: Monday—Left New York, 3:12.5; reached Albany, 4:26; left Albany, 4:54; reached Syracuse, 6:26.5, Tuesday—Left Syracuse, 8.44; left Buffalo, 10:45; left Toronto on return, 11:28.5; left Buffalo, 12:09; left Syracuse, 3:13; left Albany, 4:34 arrived New York, 5:50.

Major R. M. Schroeder, in a Vought VE-7, was the second to complete the course. Two minutes after Lieutenant Plumb landed at the New York end of the course, Major Schroeder landed at Toronto. He had been the second to make the flight one way. His trip to New York consumed 6 hours and 22 minutes, while the return voyage was announced to be 9 hours and 35 minutes. These figures were not confirmed as official.

Sergt. A. B. Coombs, piloting a De Haviland-9A plane, was the first aviator to complete the trip one way. Sergeant Coombs landed at Roosevelt Field on Long Island at 7:11 o'clock Monday evening, having made the 521 miles from Toronto in 6 hours and 21 minutes. Coombs and his observer, Lieut. Maurice Holland, encountered extremely bad weather in flying over Lake Erie, where the wind became a gale at altitude above 2,500 feet. He made the return flight the next day. Sergeant Coombs was the winner of the race from Belmont Park to the Statue of Liberty and return a year ago.

Roland Rohlfs, in a Curtiss Oriole, holder of the world's official altitude record, was the second to land at New York, arriving seven minutes after Coombs. Rohlf's time was announced as 6 hours and 36 minutes. Rohlfs also started back Tuesday, reaching Albany shortly after noon.

Lieut. B. N. Maynard, also in a De Haviland-4, reached Toronto soon after Lieutenant Plumb and was the third to complete the circuit. His DH was also Liberty engined, and Lieutenant Dalton was his passenger.

On his trip to Toronto Lieutenant Maynard took over the bag of mail for Canada from J. D. Hill, whose Oriole was one of those that came to grief at Albany. A letter from President Wilson to the Prince of Wales was included in this sack and forwarded to him as soon as Maynard arrived at Toronto.

Maynard's time, which, like Plumb's, is not yet complete, was: Monday, left New York, 4:03; arrived Albany, 5:04; left Albany, 5:48; arrived Syracuse, 7:06. Tuesday, left Syracuse, 9:31.5; left Buffalo, 11:45; left Toronto, 12:09. The De Haviland drove across Lake Ontario in the amazing time of nine minutes, reaching a speed of close to 200 miles an hour.

Capt. A. E. Simonin, in a De Haviland-4, after having lost his way, reached Toronto in safety, but had his machine overhauled before starting on the return trip.

The fourth aviator to reach the Leaside aerodrome was Lieut. R. F. Midkiff, also in a De Haviland-4. He carried Sergeant Neville as a passenger. His plane's engines had run 140 hours without overhauling, and took part in the recent flight from Dallas to Boston.
for Syracuse.

Lieut.-Col. W. C. Barker, Canadian ace, winner of several decorations in the war, arrived at New York from Toronto early Tuesday morning in a captured Fokker. Colonel Barker carried a bag of mail for Washington. He flew his plane with one hand because of injuries received in a fight with a squadron of enemy machines in October, 1918, and could not use his compass. His plane was the center of interest at Roosevelt Field. His was the first international mail. Colonel Barker started right back, and at latest reports had left Albany

Lieut. A. D. Schiller, in a Canadian Training Plane, arrived Tuesday at New York from Toronto.

The second captured German Fokker was flown by Capt. H. W. Cook and successfully made the flight from Toronto to New York.

Lieut. Philip Melville, in a Caproni, left the field at 8:50 o'clock, as did Lieut. Roulett in a De Haviland-4. Lieut. F. Honsignor left at 9:03 o'clock in a De Haviland-4, Capt. C. H. Reynolds in another De Haviland-4 at 9:04 o'clock and Lieut. Ross Kirkpatrick in a De Haviland-4 at 9:16 o'clock.

Lieut. P. H. Logan, who left Monday in a Le Pere machine and developed engine trouble at Albany, flew back from Albany Tuesday, arriving at Roosevelt Field at 9:28 o'clock, and fifteen minutes later again took the air on the flight to Toronto.

Bert Acosta, who left Toronto in a Curtiss Oriole reached New York at 9:11 o'clock, Tuesday. He started on the return flight at ten o'clock.

Colonel H. B. Claggett, in a DH-4, who was the fifth to start from New York Monday afternoon, was out of the running early. His machine hit a rut and turned turtle after landing at Quentin Roosevelt Field at Albany; J. D. Hill in the Curtiss Oriole was also eliminated from the race when his machine turned upside down there. His passenger was carrying a letter from Mayor Hylan inviting the Prince of Wales to visit New York. Capt. F. E. Kindley in an SE-5 was also forced to drop out at Albany, as was Austen B. Crehore in an SVA.

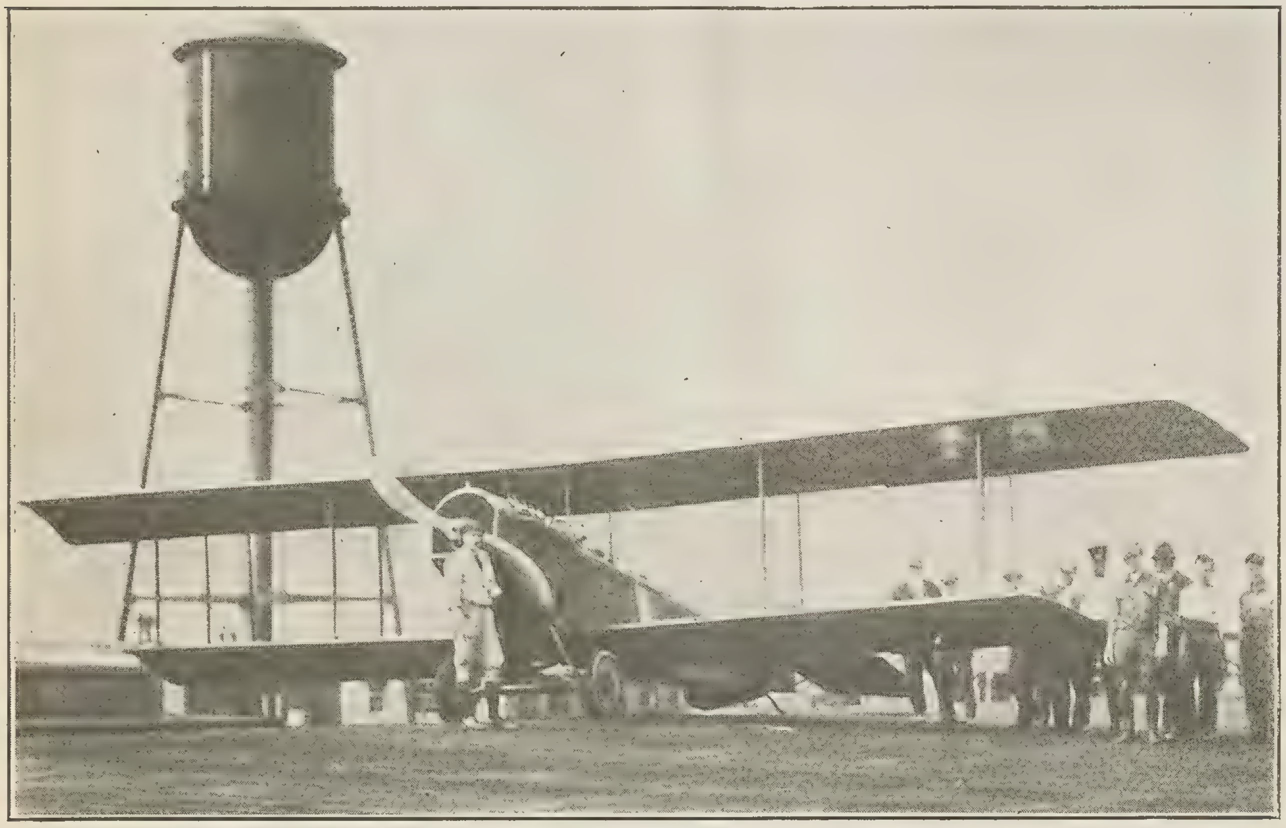
The group that reached Syracuse from New York Monday included Major J. W. Simons in a DH-4, Lieut. W. C. F. Brown in a DH-4, Major J. L. Lyons in a JN-4D, Col. U G. Jones in a JN-6H, and Major Elliot Springs in an L-W-F biplane, whose start from Roosevelt Field is shown on the cover of this week's AIRCRAFT JOURNAL.

Aviator Lands on Roof and Hops Off Again

Edwin E. Ballough, with Photographers, Alights on Army Quartermaster Building in Newark—Flight Not Prearranged

For the first time an aviator carrying a passenger landed on the roof of a building, then started his motor and sailed away safely.

The aviator was Edwin E. Ballough, who served as a lieutenant with the Air Service during the war, and who is now employed as aviator by a dry goods firm in Newark, N. J. He landed on the roof of one of the Army quartermaster stores in Newark, N. J.



EDWIN E. BALLOUGH ON QUARTERMASTER DEPOT ROOF

Photo C. M. Wagner

From a height of 700 feet Ballough circled the Army Quartermaster Depot Building, and decided to land on the roof. The flight had not been previously planned. There is a peak on the roof, and it was on this that the machine landed. Ballough used a Curtiss plane. With him in the machine at the time was Chris M. Wagner, a photographer, who took a number of pictures of the machine and the Submarine Boat Corp.

Ballough picked out a warehouse 987 feet long and 80 feet wide, with a peaked roof, inclining slightly downward on either side of the peak. The machine spiraled down to a low level and straightened out just above the roof. It then landed successfully straddling the peak, the greatest danger being the possibility that the machine would go over the edge of the roof sidewise. Ballough stopped the plane about ninety feet from the end of the warehouse, and after resting there some minutes, backed up, started his motor, and "took off" without a great deal of trouble, although after leaving the roof the plane came down so low that it almost grazed the water of the ship canal.

Hundreds of people below watched the machine as it neared the building, and when the plane dived for the building they thought that there had been an accident due to the fact the motor was dead, and apparently the plane had entered into a nose dive.

Their offers were not needed, for the aviator landed on the peak and glided to the roof level. Thinking that the machine might go over the edge, Ballough ordered the photographer to get out and hold the wing tip, stopping the plane dead within seventy-five feet of the end of the roof.

Having accomplished a safe landing, the next step was to get away from the roof. They backed the plane to the rear of the roof and started the engine. Assistants held the Curtiss plane until a given signal, and with a roar as the throttle was opened wide, the airplane taxied along the roof and took the air.

Ballough's stunt calls to mind the occasion when Jules Vedrines alighted on the roof of the Galleries Lafayette at Paris last January. Paris police regulations prevented him from trying to make a getaway from the roof. Vedrines, a daring exhibition and army pilot, was killed a few weeks later while trying to fly from Paris to Algiers. He won $5,000 for landing on the roof, and was fined 35 francs for dropping down within the walls of the city. Ballough neither won a prize nor paid a fine.

In describing the flight, Ballough said: "At first we flew a few thousand feet above Port Newark, but the haze obscured our vision of the yards, so we came down a bit. Then we had some fun for several minutes in seeing how close we could come to ships, derricks, and other uprights without touching them. The plane was in good trim, and all other conditions were splendid at the height we assumed. At times, as we banked and swooped around, we could almost reach out and touch the objects we skimmed.

"Finally I took her up to where the Quartermaster's warehouses are situated, and flew very low. All of a sudden, the idea to try a landing flashed across my mind. Until then I had never thought of the stunt. So I decided to take a chance, and picked out one of the buildings nearly 1,000 feet long and about 80 feet wide.

"The plane landed beautifully, easily, but I had to watch out, for the building had a peaked roof, tapering to both sides. I straddled the peak and trusted to luck, for once the wheels make a landing I have very little control over the steering apparatus, and there was always the fear that the plane would turn a little to one side, which would send us over the side of the building. That would mean a crash.

"For a minute I thought, too, that the plane would not stop in time, but would go on down to the end of the building, so I shouted to Wagner to jump out and hold her back. But this wasn't necessary, as before he was able to climb out I had her stopped, about 90 feet from the end."

Later in the day Ballough made his regular delivery for L. Bamberger & Co., for whom he flies.

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Fast Oriole Flight

J. D. Hill, piloting a Curtiss three-passenger Oriole biplane, flew from Buffalo to New York, a distance of 440 miles, in 4 hours and 10 minutes, August 22, establishing a time record between the two cities, but was not officially recorded.

Hill made the flight as official pathfinder for the International Aerial Handicap race, New York to Toronto and return. Hill left the Curtiss Field at Buffalo, which is one of the control stations in the race, and then followed the official course to Roosevelt Field, Long Island.

R-34 Honors Gazetted

The decorations awarded in connection with the trans-Atlantic flight of the airship R-34 have been gazetted. Major G. H. Scott, commander of the dirigible receives a Commandership in the Military Division of the Order of the British Empire.

To Brig. Gen. E. M. Maitland who represented the British Air Ministry on the flight; Captain G. H. Cooke, the navigating officer, Lieutenant Guy Harris, the meteorologist, and Lieutenant John D. Shooter, engineer officer of the R-34, are awarded the Air Force Cross, and six sergeants who were aboard the airship receive Air Force Medals.

British Seek Mail Data

That the American aerial mail service is attracting international attention is indicated by the receipt of a letter from Winston Spencer Churchill, British Air Minister, to John A. Jordan, superintendent of the Cleveland-Chicago air mail division, in which he seeks all possible data on the system. The letter has been forwarded to Washington.

Mr. Churchill's letters bring data on British air systems and says Great Britain is seeking every possible method to improve and develop aerial travel.

New Air Routes

The Curtiss Aeroplane and Motor Corp. has announced plans for three air routes for passenger service. They will be to Rochester, Syracuse, Utica and Albany; to Erie and Pittsburgh, Pa., and across the Canadian border to Hamilton and Toronto. The State route will be opened this fall, but the other two probably will not be in operation until spring.

Peace Treaty Convention Relating to Aeronautics

Aeronautical Commission of Conference Called Upon to Study All Air Questions and Submit Report to Supreme Council

The Aeronautical Commission of the Peace Conference formed to consider the problems of aircraft in connection with the Peace Treaty held meetings in Paris and presented reports which formed the basis of the sections of the Treaty relating to the air.

The American representatives on the Commission were Admiral Knapp and General Patrick. The British Empire, France, Italy, Japan, Belgium, Brazil, Cuba, Greece, Portugal, Roumania, and the Serb-Croat-Sloven State also were represented. On sub-committees, the United States was represented by Captain Morton, Lieutenant Kiely, Brigadier General Foulois, Captain Luke MacHamel, U. S. N., Lieutenant-Colonel Butterfield, Lieutenant-Commander J. L. Callan, Commander Pollock, Captain Bacon, U. S. A.

The subjects studied by the Commission were:

1. To study all air questions which were submitted to it by the Supreme Peace Council.
2. To study all air questions which the Commission deemed their duty to submit to the Supreme Peace Council.
3. To draft a convention relating to Air Navigation.

Certain specific questions were considered at the meetings such as the possible conversion of civil aircraft into battleplanes, the German aircraft industry's future, and the prohibition of civil aviation in Germany. Differences of opinion arose among the delegations which caused reservations to be made, the United States taking the position that the prohibition of civil aviation in Germany after the signing of Peace is unwise.

The manufacture of aircraft by Germany and its export was also considered with differences of opinion. Rigorous control of aircraft manufacture in enemy states seemed to be the only protection possible except total elimination. The possibility of nationals of the present enemy countries engaging in aeronautical business in the Allied States was considered and it was deemed advisable to prohibit it.

The recommendations of the Commission on the provisions to be inserted in the Peace Treaty were the basis of those articles that were finally adopted.

The Principles adopted by the Commission for the purpose of guiding the sub-committees in their work were as follows:

1. Recognition: (*a*) of the principle of the full and absolute sovereignty of each State over the air above its territories and territorial waters, carrying with it the right of exclusion of foreign aircraft;

(*b*) of the right of each State to impose its jurisdiction over the air above its territory and territorial waters.

2. Subject to the principle of sovereignty, recognition of the desirability of the greatest freedom of international air navigation in so far as this freedom is consistent with the security of the State, with the enforcement of reasonable regulations relative to the admission of aircraft of the contracting States and with the domestic legislation of the State.

3. With regard to domestic regulations relative to the admission and treatment of the aircraft of the contracting States, recognition of the principle of the absence of all discrimination on the ground of nationality.

4. The recognition of the principle that every aircraft must possess the nationality of one contracting State only and that every aircraft must be entered upon the register of the contracting State the nationality of which it possesses.

5. The following provisions are recognized as desirable from an international point of view to insure the safe conduct of aerial navigation:

(i) Regulations for compulsory certificates of airworthiness and licenses for wireless equipment, at least for aircraft used for commercial purposes. Mutual recognition of these certificates and licenses by the contracting States.

(ii) Regulations for compulsory licenses of pilots and other personnel in charge of aircraft. Mutual recognition of these licenses by the contracting States.

(iii) International rules of the air, including international rules as to signals, lights, and for the prevention of collisions. Regulations for landing and on the ground.

6. Recognition of the principle of special treatment for military, naval and State aircraft when they are in Government service.

7. Recognition of the right of transit without landing for international traffic between two points outside the territory of a contracting State, subject to the right of the State traversed to reserve to itself its own internal commercial aerial traffic and to compel landing of any aircraft flying over it by means of appropriate signals.

8. Recognition of the right of use by the aircraft of all the contracting States of all public aerodromes upon the principle that charges for landing facilities should be imposed without discrimination on the ground of nationality.

9. Recognition of the principle of mutual indemnity between the contracting States to cover damage done to person or property in one State by Government aircraft of another State.

10. Recognition of the necessity of a permanent International Aeronautical Commission.

11. Recognition of the obligation of each contracting State to give effect to the provisions of the Convention by its domestic legislation.

12. Recognition of the principle that the Convention does not affect the rights and duties of belligerents or neutrals in time of war.

Annex V to the Treaty, which contains the "Convention Relating to International Air Navigation," is published herewith in full. The annexes and appendices to the Convention will appear in subsequent issues of AIRCRAFT JOURNAL.

Convention Relating to International Air Navigation

CHAPTER I.

GENERAL PRINCIPLES.

ARTICLE 1.

The contracting States recognise that every State has complete and exclusive sovereignty in the air space above its territory and territorial waters.

ARTICLE 2.

Each contracting State undertakes in time of peace to accord freedom of innocent passage above its territory and territorial waters as well as above the territories and territorial waters of its Colonies to the aircraft of the other contracting States, provided that the conditions established in this Convention are observed.

All regulations made by a contracting State as to the admission over its territory of the aircraft of the other contracting States shall be applied without distinction of nationality.

ARTICLE 3.

Each contracting State has the right, for military reasons or in the interest of public safety, to prohibit the aircraft of the other contracting States, under the penalties provided by its legislation and subject to no distinction being made in this respect between its private aircraft and those of the other contracting States, from flying over certain areas of its territory.

If it makes use of this right, it shall publish and notify beforehand to the other contracting States the location and extent of the prohibited areas.

ARTICLE 4.

Every aircraft which finds itself above a prohibited area shall, as soon as aware of the fact, give the signal of distress provided in Paragraph 17 of Annex D and land outside the prohibited area as near to it as possible at one of the aerodomes of the State unlawfully flown over.

CHAPTER II.

NATIONALITY OF AIRCRAFT.

ARTICLE 5.

No contracting State shall, except by a special and temporary authorization, permit the flight above its territory of an aircraft which does not possess the nationality of a contracting State.

ARTICLE 6.

An aircraft possesses the nationality of the State on the register of which it is entered, in accordance with the provisions of Section I (*c*) of Annex A.
one State.

ARTICLE 7.

An aircraft shall not be entered on the register of one of the contracting States unless it belongs wholly to nationals of such State.

An incorporated company cannot be the registered owner of an aircraft unless it possesses the nationality of the State in which the aircraft is registered, and unless the President or chairman of the company and at least two-thirds of the directors possess the same nationality, and unless the company fulfills all other conditions which may be prescribed by the laws of each State.

ARTICLE 8.

An aircraft cannot be validly registered in more than

ARTICLE 9.

The contracting States shall every month exchange among themselves and transmit to the International Commission for Air Navigation copies of registrations and of cancellations of registration which shall have been entered on their official registers during the preceding month.

ARTICLE 10.

All aircraft engaged in international navigation shall bear their nationality and registration marks as well as the name and residence of the owner in accordance with Annex A.

CHAPTER III.

CERTIFICATES OF AIRWORTHINESS AND COMPETENCY.

ARTICLE 11.

Every aircraft engaged in international navigation shall, in accordance with Annex B, be provided with a certificate of airworthiness issued or rendered valid by the State whose nationality it possesses.

ARTICLE 12.

The commanding officer, pilots, engineers and other members of the operating crew of every aircraft shall, in accordance with Annex E, be provided with certificates of competency and licenses issued or rendered valid by the State whose nationality the aircraft possesses.

ARTICLE 13.

Certificates of airworthiness and of competency and licenses issued or rendered valid by the State whose nationality the aircraft possesses, in accordance with the regulations established by Annex B and Annex E and hereafter by the International Commission for Air Navigation, shall be recognized as valid by the other States.

Each State has the right to refuse to recognize for the purpose of flights within the limits of and above its own territory certificates of competency and licenses granted to one of its nationals by another contracting State.

ARTICLE 14.

No wireless apparatus shall be carried without a special license issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special license for the purpose.

Every aircraft used in public transport and capable of carrying ten or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

CHAPTER IV.

ADMISSION TO AIR NAVIGATION ABOVE FOREIGN TERRITORY.

ARTICLE 15.

Every aircraft of a contracting State has the right to cross another State without landing. In this case it shall follow the route fixed by the State over which the flight takes place. However, for reasons of general security it will be obliged to land if ordered to do so by means of signals provided in Annex D.

Every aircraft which passes from one State into another shall, if the regulations of the latter State require it, land in one of the aerodromes fixed by the latter. Notification of these aerodromes shall be given by the contracting States to the International Commission for Air Navigation and by it notified to all the contracting States.

The establishment of international airways shall be subject to the consent of the States flown over.

ARTICLE 16.

Each contracting State shall have the right to reserve to its national aircraft the carriage of persons and goods for hire between two points on its own territory.

ARTICLE 17.

If a contracting State establishes restrictions of the kind permitted by Article 16, its aircraft may be subjected to the same restrictions in any other contracting State, even though the latter State does not itself impose these restrictions on other foreign aircraft.

Restrictions and reservations provided in Article 16 shall be immediately published, and shall be communicated to the International Commission for Air Navigation which shall notify them to the States interested.

ARTICLE 18.

The passage or transit of any aircraft with or without landing over or through the territory of any contracting State, including stoppages reasonably necessary for the purpose of such transit, shall not entail any seizure or detention of the aircraft by or on behalf of such State or any person therein, on the ground that the constitution or mechanism of the aircraft is an infringement of any patent, design or model duly granted or registered in such State. Every claim for an infringement of this kind shall be duly made in the country of origin of the aircraft.

CHAPTER V.

RULES TO BE OBSERVED ON DEPARTURE, ON LANDING, AND WHEN UNDER WAY.

ARTICLE 19.

Every aircraft engaged in international navigation shall be provided:

(*a.*) With a certificate of registration in accordance with Annex A.
(*b.*) With a certificate of airworthiness in accordance with Annex B.
(*c.*) With certificates and licenses of the commanding officer, pilots and crew in accordance with Annex E.
(*d.*) If it carries passengers, with a list of their names.
(*e*) If it carries freight, with bills of lading and manifest.
(*f.*) With log books in accordance with Annex C.
(*g.*) If equipped with wireless, with the special license prescribed by Article 14.

ARTICLE 20.

The log books shall be kept for two years after the last entry.

ARTICLE 21.

Upon the departure of an aircraft, the authorities of the country shall have, in all cases, the right to visit the aircraft and to verify all the documents with which it must be provided.

ARTICLE 22.

Upon the landing of an aircraft, the authorities of the country shall have, in all cases, the right to visit the aircraft and to verify all the documents with which it must be provided.

ARTICLE 23.

All persons on board an aircraft shall conform to the laws and regulations of the State visited.

In case of flight made without landing from frontier to frontier, all persons on board shall conform to the laws and regulations of the country flown over, the purpose of which is to ensure that the passage is innocent.

Legal relations between persons on board an aircraft in flight are governed by the law of the nationality of the aircraft.

In case of crime or misdemeanor committed by one person against another on board an aircraft in flight the jurisdiction of the State flown over applies only in case the crime or misdemeanor is committed against a national of such State and is followed by a landing during the same journey upon its territory.

The State flown over has jurisdiction:

(1) With regard to every breach of its laws for the public safety and its military and fiscal laws;
(2) In case of a breach of its regulations conconcerning air navigation.

ARTICLE 24.

Aircraft of the contracting States shall be entitled to the same measures of assistance for landing, particularly in case of distress, as national aircraft.

With regard to the salvage of aircraft wrecked at sea the regulations of the several contracting States as to the salvage of ships will apply so far as practicable.

ARTICLE 25.

Every aerodrome in a contracting State, which upon payment of charges is open to public use by its national aircraft, shall likewise be open to the aircraft of all the other contracting States.

In every such aerodrome there shall be a single tariff of charges for landing and length of stay applicable alike to national and foreign aircraft.

ARTICLE 26.

Each contracting State undertakes to adopt measures to ensure that every aircraft flying above the limits of its territory, and that every aircraft under its flag, wherever it may be, shall comply with the regulations contained in Annex D of the present Convention. It will punish all persons who do not obey these regulations.

CHAPTER VI.

PROHIBITED TRANSPORT.

ARTICLE 27.

The carriage by aircraft of explosives and of arms and munitions of war is forbidden in international navigation. No foreign aircraft shall be permitted to carry such articles between any two points in the same contracting State.

ARTICLE 28.

Each State may prohibit or regulate the carriage or use of photographic apparatus. Any such regulations shall be at once notified to the International Commission for Air Navigation, which shall communicate this information to all the other contracting States.

ARTICLE 29.

As a measure of public safety, the carriage of objects other than those mentioned in Articles 27 and 28 may be subjected to restrictions by each contracting State. Any such regulations shall be at once notified to the International Commission for Air Navigation, which shall communicate this information to all the other contracting States.

ARTICLE 30.

All restrictions mentioned in Article 29 shall be applied equally to national and foreign aircraft.

CHAPTER VII.

STATE AIRCRAFT.

ARTICLE 31.

The following are deemed to be State aircraft:—

(*a.*) Military aircraft.
(*b.*) Aircraft exclusively employed in State service, such as posts, customs, police.

Every other aircraft is a private aircraft. All state aircraft other than military, customs and police aircraft shall be treated as private aircraft and as such shall be subject to all the provisions of the present Convention.

ARTICLE 32.

Every aircraft commanded by a person in military service detailed for the purpose is deemed to be a military aircraft.

ARTICLE 33.

Neither the flight of a military aircraft of a contracting State over the territory of another nor its landing upon such territory shall be permitted without special authorization.

In case of such authorization the military aircraft shall enjoy in the absence of special stipulation the privileges of exterritoriality which are customarily accorded to foreign ships of war.

A military aircraft which is forced to land or which is required or compelled to land shall by reason thereof acquire no right to exterritoriality.

ARTICLE 34.

Agreements between State and State will determine in what cases police and customs aircraft can be authorized to cross the frontier. They shall in no case be entitled to the privileges of exterritoriality.

CHAPTER VIII.

INTERNATIONAL COMMISSION FOR AIR NAVIGATION.

ARTICLE 35.

There shall be instituted, under the name of the International Commission for Air Navigation and as part of the organization of the League of Nations, a permanent Commission composed of:

Two Representatives of each of the following States: The United States of America, France, Italy and Japan;

One Representative of Great Britain and one of each of the British Dominions and of India;

One Representative of each of the other contracting States.

Each of the five States first-named (Great Britain, the British Dominions and India counting for this purpose as one State) shall have the least whole number of votes which, when multiplied by five, will give a product exceeding by at least one vote the total number of the votes of all the other contracting States.

All the States other than the five first naied shall each have one vote.

The International Commission for Air Navigation shall determine the rules of its own procedure and the place of its permanent seat, but it shall be free to meet in such places as it may deem convenient. Its first meeting shall take place at Paris. This meeting shall be convened by the French Government, as soon as a majority of the signatory States shall have notified to it their ratification of the present Convention.

The duties of this Commission are:

(*a.*) To receive proposals from or to make proposals to any of the contracting States for the modification or amendment of the provisions of the present Convention and to notify changes adopted.
(*b.*) To carry out the duties imposed upon it by the present Article and by Articles 9, 13, 14, 15, 17, 28, 29, and 38 of the present Convention.
(*c.*) To amend the provisions of the technical Annexes.
(*d.*) To collect and communicate to the contracting States information of every kind concerning international air navigation.
(*e.*) To collect and communicate to the contracting States all information relating to wireless, meteorology and medical science which may be of interest to air navigation.
(*f.*) To ensure the publication of maps for air navigation in accordance with the provisions of Annex F.
(*g.*) To give its opinion on questions which the States may submit for examination.

Any modification of the provisions of any one of the Annexes may be made by the International Commission for Air Navigation when such modification shall have been approved by three-fourths of the total possible vote and shall become effective from the time when it shall have been notified by the International Commission for Air Navigation to all the contracting States.

Any proposed modification of the articles of the present Convention shall be examined by the International Commission for Air Navigation, whether it originates with one of the contracting States or with the International Commission for Air Navigation itself. No such modification shall be proposed for option by the contracting States, unless it shall have been approved by at least two-thirds of all the possible votes which could be cast if all the States were present.

All such modifications of the articles of the Convention (not of the provisions of the Annexes) must be formally adopted by the contracting States before they become effective.

The expenses of organization and operation of the International Commission for Air Navigation shall be borne by the contracting States in proportion to the number of votes at their disposal.

The expenses occasioned by the sending of technical delegations will be borne by their respective States.

CHAPTER IX.

FINAL PROVISIONS.

ARTICE 36.

Each contracting State undertakes to co-operate as far as possible in international measures concerning:

(*a.*) The collection and dissemination of statistical, current, and special meteorological information, in accordance with the provisions of Annex G.
(*b.*) The publication of standard aeronautical maps, and the establishment of a uniform system of ground marks for flying, in accordance with the provisions of Annex F.
(*c.*) The use of wireless in air navigation, the establishment of the necessary wireless stations, and the observation of international wireless regulations.

ARTICLE 37.

General provisions relative to customs in connection with international air navigation are the sub-

(*Continued on page* 14)

Cleveland Celebrates Week of Aeronautics

Hundredth Day of Perfect Performance by Western Division of Air Mail Marked on Program of Cleveland Aviation Club

The hundreth day of perfect performance by the Western Division of the Air Mail Service came as the climax of five days' exhibition flying and passenger carrying in Cleveland. It was made the occasion of a visit to Cleveland at the end of a week's aeronautics by Second Assistant Postmaster Otto Praeger and Col. Halsey Dunwoody, Chief of the Technical Division, Air Service, A. E. F. It was marked by excellent flying by De Haviland airplanes from McCook Field, a number of Curtiss planes and a flight by a Martin Bomber.

At a luncheon given at the Union Club Postmaster Praeger gave an interesting interpretation of the work of the Post Office. He explained that it had saved the Government $170,000 which would otherwise have been spent to carry mail by train, and that this saving meant that the reduction to a two cent rate had been based on sound economic reasons.

"The Aerial Mail," stated Mr. Praeger, "has brought the East and Middle West closer together by sixteen hours, and the Atlantic and Pacific Coasts by twenty-four hours. We take the night's mail out of New York and deliver it in Cleveland before the morning is half spent, and in Chicago between noon and 1 P. M. We take the mail out of Cleveland in the forenoon and absolutely assure its delivery in Chicago the same afternoon. We overtake at Cleveland the train leaving New York at 5.30 P. M. and deliver to it the mail for the Chicago gateway connections that could not be gotten ready for the dispatch on the 8.40 train of the evening before. We take off the train from New York due to arrive in Chicago late in the afternoon after all carried deliveries have ceased, mail from the East and deliver it to the people of Chicago shortly afternoon and in time to make every Chicago City carrier route.

"Eastbound, we leave Chicago at 2.30 in the afternoon and overtake the Twentieth Century Limited at Cleveland, delivering to that train thousands of letters for delivery in New York City at 9.40 the following morning, which, if they had gone through by train, would have arrived too late in New York City for carrier delivery on that date. Going to New York, in addition to the Cleveland city mail, we take from a train leaving Chicago at 11 o'clock the previous night, and which is not due to arrive in New York City until after all carrier deliveries have ceased, mail from Chicago and the West and deliver it in New York City early in the afternoon and in ample time to catch 992 city carriers.

"We have given you a demonstration of what the Aerial Mail can really do if it is turned loose and it rests with the people of the country now to tell Congress whether their mail shall take twelve hours to Cleveland from the Atlantic Coast and twenty hours to Chicago on the fastest trains, or 5 hours to Cleveland and 9 hours to Chicago as is being done daily by the Post Office Department."

During the 100 days the Cleveland and Chicago division has been in operation, the small ships have flown a total of 65,000 miles and carried more than 3,000,000 letters, Mr. Praeger declared.

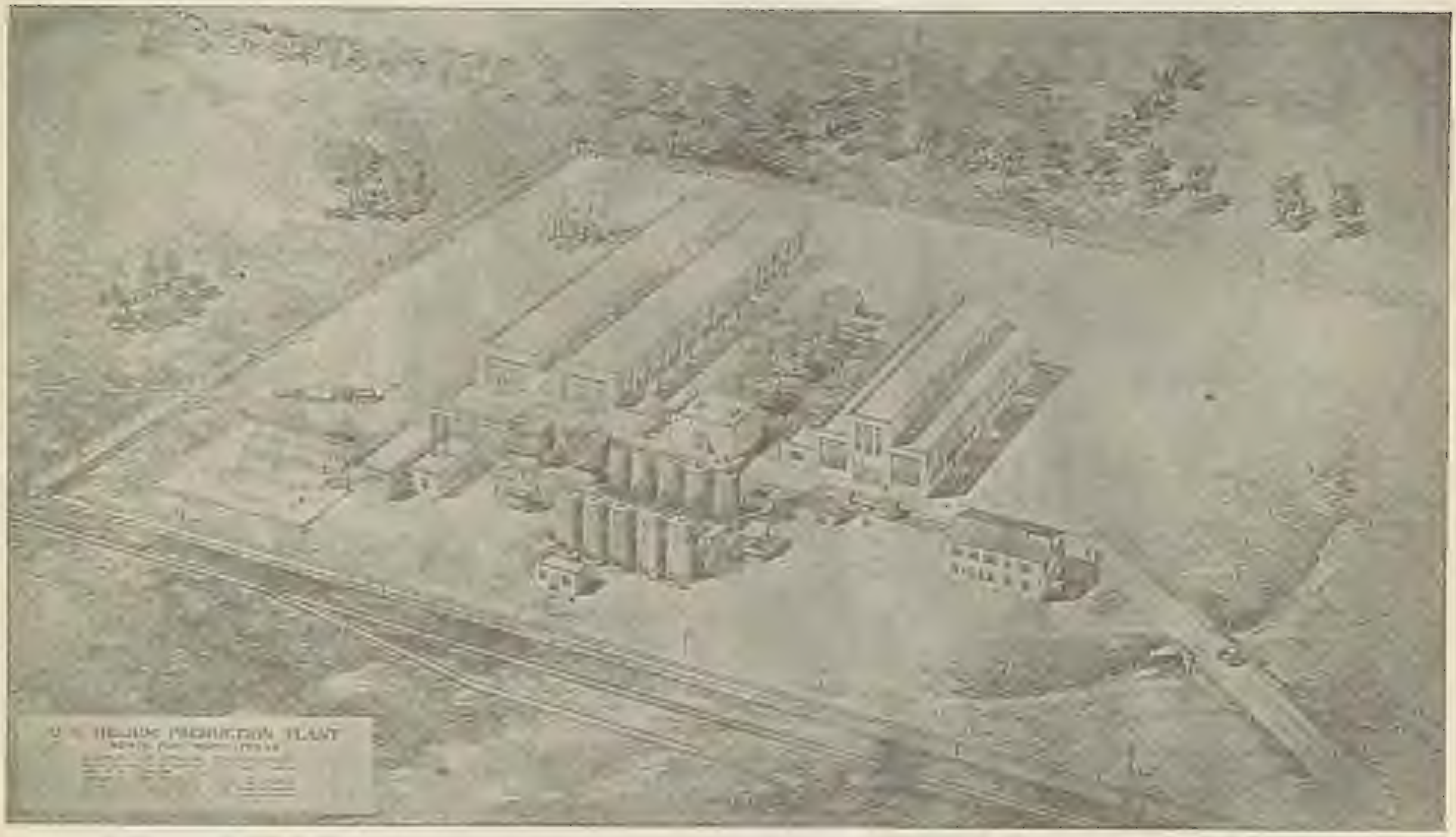
"This achievement as a commercial proposition overshadows the purely aviation aspect of the performance," said Mr. Praeger.

Mr. Praeger announced a ten per cent increase in all Aerial Mail salaries, effective September 1. He said he expected the air mail to be in operation to Minneapolis, Omaha and St. Louis by early spring, when multi-motored ships, carrying as much as 3,000 pounds of mail would be available. The air mail between New York and Washington and New York and Chicago had already saved the country $170,000 a year over the railway mail, he said, and he declared that when the multi-motored ships were in operation there would be an annual saving of $1,500,000.

Earlier in the week Cleveland had its first taste of passenger carrying. Seven Curtiss JN planes were at the Aerial Mail Field at Woodland Hills Park, and these not only performed for the benefit of Cleveland spectators, but took up scores of people daily. Two young women of five and six respectively went up on the first two days, and a number of women passengers of all ages revealed

(*Continued on page* 18)

New United States Helium Production Plant


U. S. HELIUM PRODUCTION PLANT

THE UNITED STATES HELIUM PRODUCTION PLANT AT NORTH FORT WORTH, TEXAS, IS UNDER CONSTRUCTION AND NEARING COMPLETION. THE COMPRESSION BUILDING IS 300 FT. BY 200 FT., WHILE THE SEPARATION BUILDING WILL BE 200 FT. BY 75 FT. A PIPE LINE TO PETROLIA, TEXAS, 96 MILES LONG, IS ALREADY FINISHED

L. D. GARDNER. . .*President and Editor*
W. D. MOFFAT. . . . . . *Vice-President*
W. I. SEAMAN. . . . . *Treasurer*
H. M. WILLIAMS. . . . *General Manager*

AIRCRAFT
JOURNAL

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Formerly Air Service Journal

Aviation Investigations

THE hearings of the Aviation Sub-Committee on War Expenditures have brought out many facts which will give the public a new point of view of the waste of money on aviation during the war. The fact that Howard Coffin, Col. E. A. Deeds, William C. Potter and John D. Ryan, the civilians who were in practical charge of Air Service production had no experience with aircraft before their taking over the large responsibilities of our aircraft program is being stressed. The DH-4 and the Liberty motor are still storm centers of controversial opinion. The burning of planes abroad and the building of railroads in the Northwest for lumber operations are bringing to the surface many statements which have not been aired before.

Of investigations of aircraft expenditures during the war, there will probably be no end for many years to come. Previous hearings have had a judicial aspect. This hearing appears to throw the door open wide and is letting all who have any grievance or complaint to have the floor. Such an investigation will do a great service to the country for there is nothing so salutary where a situation is complicated by hard feeling as to give every side an opportunity to be heard.

Progress of the Independent Air Force

THE progress made in Congress toward the favorable reporting of a bill creating an Independent Air Force appears to be substantial. The hearings of the Senate Military Affairs Committee have brought out that it is probable that the contest will be made on one side by the General Staff and those who reflect its opinion, the Navy and its adherents, and on the other by a practically unanimous group of civilians, a large percentage of whom have been in the Air Service. The sentiment of the Senators and Representatives who are most interested in the Air Service seems to be entirely in favor of an independent service.

That the wastefulness of the expenditures under the War Department will have an important bearing, there is no doubt. If all air control were vested in a single group, the sums appropriated could be better controlled and watched, but to have a dozen Congressional committees passing uncoordinated aeronautical appropriations is becoming a reckless procedure that is certain to be corrected. Now is the time for all who believe in the future of air power to make their views known to Congress.

Proper Landing Fields

PROPER landing fields—the crux of commercial flying. A bromide but never accentuated with more force than in the New York-Toronto Air Race. Fighting impossible weather at both ends that would have absolutely halted a cross-country automobile race, the planes came through with records for speed, engine reliability and air-worthiness which measure a very important advance along the road to established air transportation in America.

The fortunate record was nearly marred at Albany due to a small and dangerous landing field. Only the great skill of the pilots in landing at this cramped field against the added handicap of a cross gale saved dangerous crashes. The pilots who piled up at this point without serious results to themselves, passengers or spectators were the victims of specially bad conditions. Conditions such as these ought to be speedily eliminated.

Bills Pending in Congress

TWO bills pending in Congress are extremely important in their ultimate effect on the Air Service. They are deserving of the most careful attention.

The allowance to the Air Service of twelve hundred commissioned officers after October 30 would prevent the Air Service passing out of existence entirely, as it will, if it can only retain the two hundred and thirty regular officers now in it. Some such measure will have to be enacted to keep the Air Service from going to pieces. But the provision that 85 per cent of these officers shall be duly qualified flyers will work a hardship at this time which may be as unfortunate as in having fewer officers. It is a sound principle that to secure an engineer or supply officer in the Air Service, the best man available should be selected without regard to his flying skill. Afterwards, he should become a flyer as should all officers in the Air Service. But to limit the selection at this time to flyers for practically all work would be unfortunate.

The other bill authorizes the Secretary of War to detail twenty-five Army officers to receive aeronautic instruction at such schools as he may select and provides for their maintenance. This bill is excellent in its intent and will provide the Air Service, as a similar routine has provided the Navy, with properly trained aeronautic engineers to take charge of the development of airplanes.

In Store on the Border

THE predicament that the Air Service will find itself in case of serious trouble on the Mexican Border will be a disgrace to this country. With only one obsolete type of plane available, no orders having been placed for equipment, and no prospect of pursuit, bombing or other service planes near, the country can well feel disturbed over the outlook.

Warnings have been plentiful but the deadlock that seems to have been reached between Congress and the War Department over the Air Service will, unless speedily broken, cause the public to realize that unification of aircraft activities is essential.

Limitation in Size of Airplanes

THE question of limitation in size of airplanes has been discussed again and again from a theoretical standpoint. For geometrically similar airplanes the validity of the $A^{3/2}$ law has been established, which expressed in non-mathematical language means that the weight of an airplane wing truss increases more rapidly than the area, since the area increases as the square of the linear dimensions while the weight of the truss increases as the linear dimensions.

Airplane designers have always been of the opinion, however, that in the large structure refinement of design, impossible in the small machine, would counterbalance in a practical way the workings of the theoretical mathematical law.

It would seem, however, that even with refined structural design, the very large machine will be working at a handicap, particularly as regards speed. Thus while the best-modern design can give us 150 miles per hour on a two seater biplane, the well conceived and built Martin Bomber only gives 118 miles. The four-engined Handley-Page falls a little below 100 miles per hour. The NC type gives 84 miles per hour. It is true that these large machines have a greater radius of action, nevertheless it would seem almost an impossibility to obtain with these machines a speed equal to the faster smaller machines. And this is due not to resistance but to structural weight.

Notes on Technical Aeronautics

Direction Finding

The last four years of war have afforded a real opportunity for the wireless direction finder to prove its value. From effective try outs, notably at the Marconi war stations where it was in constant use day and night, a fund of information is now available.

In the hands of the British the direction finder was of value in guiding aircraft and in locating enemy wireless installations on land, at sea and in the air. For the latter purpose a number of special stations were erected at selected points on the coast and elsewhere. These worked in pairs or in groups, the individual stations of a group observing, at the same moment, the direction of a particular enemy station and reporting immediately to headquarters, where, by means of a chart, the observations were combined and the position of the enemy ascertained at once.

In its application to the practical problems of marine and aerial navigation, this instrument has been used in two distinct ways,—the method of fixed stations on the ground, and that of having the stations in the ship or aircraft.

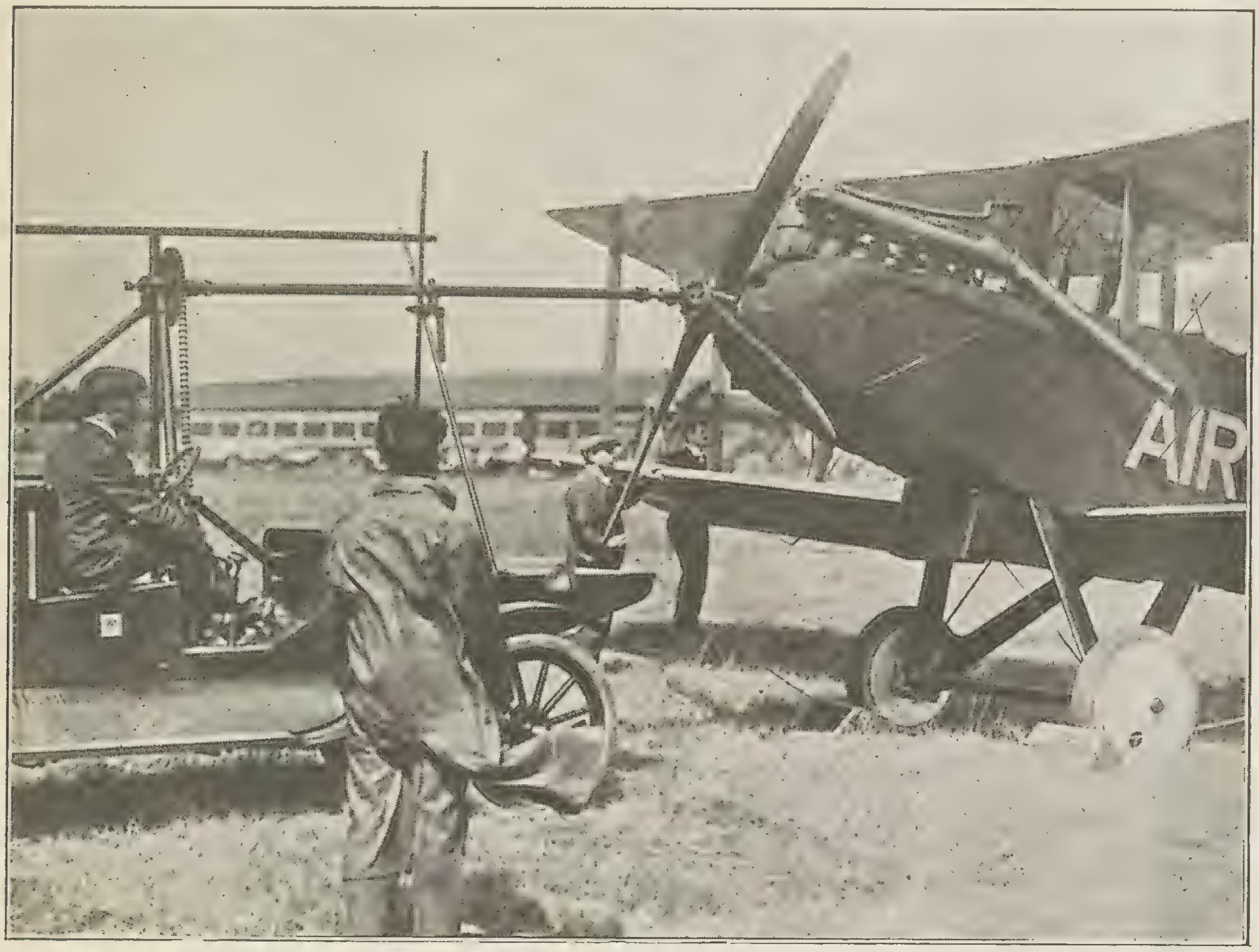
Fixed direction-finding stations present two distinct advantages over the movable stations:

1. The conditions of working in such stations compare favorably with the conditions in aircraft and aboard ship in stormy weather.
2. The number of stations required is relatively small so that highly skilled specialist operators can be employed and the stations kept continuously under expert supervision.

The objections to the fixed station method relate entirely to the practical working of the system. A ship or aeroplane without direction-finding gear when wishing to ascertain its position, must call up the fixed stations, and await acknowledgment. Then there will be an interval while the bearings are communicated by ordinary telephone or telegraph to the controlling station, and the ship's position worked out, after which the ship is advised of its position and the message acknowledged.

In view of the great increase in wireless traffic with ships and the growth of traffic with aircraft which will assuredly take place in the future, any system of working which involved prolonged signalling is clearly at a disadvantage.

The erection of fixed "beacons" or wireless "lighthouses" has been proposed, and indeed actually carried out in connection with the navigation of aircraft provided with direction-finding gear. These stations send out at specified intervals signals which are easily recognized and identified. Their maintenance is a simple matter, but their use would involve the reservation of a particular wave length for navigation purposes, so that there should be no interference between such work and the ordinary wireless traffic.



INGENIOUS DEVICE FOR "CRANKING" AIRPLANES

(C) Western Newspaper Union

Gluing Veneer

It is common practice among plywood manufacturers to dry veneer down to very low moisture contents before gluing it. The object in doing so apparently is to prevent shrinkage of the veneer and consequent marring of the appearance of the finished panel. The drying is done in plate redriers, textile driers or similar apparatus, and adds appreciably to the cost of manufacturing panels.

That such preliminary drying may not be necessary is indicated by the results of a recent investigation by the Forest Products Laboratory. Veneer panels were glued with casein glue at various high moisture contents (some over 50 per cent) and in various tests proved as strong and as desirable as those made under drier conditions. In fact, in the moisture resistance tests a considerable proportion of the veneer which had been dried before gluing showed signs of failure, whereas veneer glued at a moisture content of 15 per cent or higher gave practically perfect results. Panels made at high moisture contents checked if dried too rapidly, but this difficulty could be avoided by proper operation of the kiln.

It seems possible, therefore, that the cost of producing panels of certain kinds may be very materially lessened through the use of water resistant glue and the reduction or even elimination of preliminary drying. Very dry veneer is more likely to break or split than damp veneer; an additional saving is therefore possible through a reduction of waste.

Lines of a Flying Boat

An authoritative discussion of the lines of a flying boat hull, as used in the NC boats, is included in a recent paper on "Naval Aircraft" read before the S. A. E. by Commander J. C. Hansaker.

The hull is designed to have an easy flaring bow, so that it can be driven through a seaway to get up the speed necessary to take the air, and a strong V-bottom to cushion the shock of landing on the water.

In early flying boats it was considered necessary to have great width to make the boat plane at reasonably low speeds. A usual rule has been to allow not over 100 lb. of displacement per inch of width. Sometimes to get more width of bottom, side fins or pontoons were built out from the main hul as in the F-15, H-16 and HS-1. In the NC hull the radical step was made of getting planing by speed rather than by width.

The NC boats at the start from Newfoundland got off with a 233-lb. load per inch of width of planing bottom. This is possible because of the easy lines of the after body which permit a speed on the water up to 65 miles per hour when all engines run at full speed. Running at this rate, it is very important that the pilot have control of the fore-and-aft attitude of the boat. This he can do by rocking the boat with his elevators. To permit such rocking while planing at high speed is a rather delicate design problem. With a two or more step hydroplaning bottom, the boat planes on at least two steps and hence is fixed in attitude so that there is nothing the pilot can do to change it. With a single deep step the boat gets up on this step and is quite unstable except for the air controls. Unless the pilot is expert he may get into difficulties, especially in a swell. The NC hull has a short distance back of the center of gravity a single deep step on which the boat can be rocked by the pilot after he gets up to planing speeds, but until sufficient speed is established to make the air controls effective, the stern of the boat is also planing on the water.

The tests of the model hull in the towing basin at the Washington Navy Yard showed that the boat got up to speed quickly if trimmed about 8 deg. by the stern. In practice the pilots have verified this "optimum trim" and at the start let the boat run at this designed or natural trim until it rises to the surface of the water and begins to plane. The trim is then reduced to 6 deg. to lessen the air resistance of the wings and keep down the lift so that the boat will stay on the water until the air speed meter indicates that flying speed is attained. When this rate is reached the pilot watches the sea and "waiting for a smooth time" pulls back the elevator column to increase the angle of incidence of his wings to about 15 deg., or a trim of boat of about 12 deg., to lift himself in the air. A feature of the NC hull is the ability to be pulled back in this manner and to keep on water without "porpoising" until adequate speed is reached. Once in the air, it is necessary to stay there and not bounce back on the sea, subjecting the boat to abnormal shocks. Due to the pointed form of stern, when the pilot pulls up his elevators the point of the stern is pressed down into the water.

New Navy Hangar of Tremendous Proportions

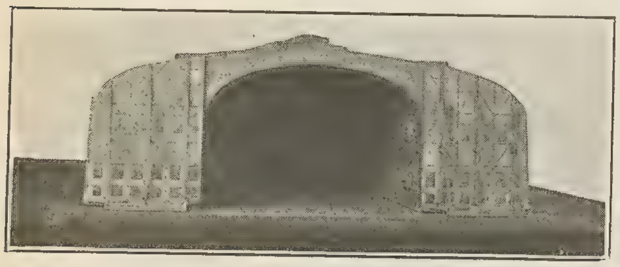
Six Grand Concourses of Capital's Famed Union Station Could Be Placed in Clear Space Provided for U. S. Airships

The visit of the R-34 considerably aroused public interest in lighter-than-air craft, and, although the recent matter of fact announcement by the Navy Department of the completion of the plans by the Bureau of Yards and Docks for the Hangar at Lakehurst, N. J., showed that the Navy is not lagging behind; the bare details given out failed to impress the mind of the public with the gigantic size of this structure.

The building is 800 feet long, 265 feet wide, and 174 feet high, inside dimensions.

The great concourse at the Union Station at Washington, is 760 feet long, by 126 feet wide, by 50 feet high, so two rooms the size of the concourse could be placed side by side on the floor of this hangar and still leave 40 feet in length and 30 feet in width. If three tiers of these were laid one on top of the other, there would still be 15 feet to spare before the bottom of the trusses is reached. In other words, six concourses could be placed within the clear space provided for the airship.

The public understands that to obtain such clear space, the necessary construction must cover a much greater area so the ground occupied by the completed hangar, including the doors, will be 920 feet long, 352 feet wide, and 200 feet high. The doors, pairs of which are to be placed at both ends, are each 131 feet wide by 177 feet high, by 60 feet thick at the bottom. Compared to the new Commercial Trust Company's building in Washington, which is 75 feet by 100 feet by 130 feet high, three of these buildings side by side would not completely close the opening, for there would be 42 feet left above.



THE HANGAR IS 200 FEET HIGH

This vast room is spanned by trusses technically known as three-hinged arches. These trusses weigh 90 tons each.

The total steel tonnage of the building will be between 8,000 and 9,000 tons, and the entire cubic contents of the building will be 50,000,000 cubic feet.

The building is to be covered with a blended colored corrugated asbestos covering, which will make the building absolutely fireproof. Huge series of windows and skylights on all sides afford ample light. There are numerous stair cases and two huge elevators leading to the roof.

In the spaces between the trusses are placed all the many shops necessary for the erection and repair of the airships. The gasoline supply and necessary buildings for the generation and storing are, of course, far removed from the hangar.

Three railroad tracks are to extend the entire length of the hangar, and, upon their completion, the permanent floor of wood block will be laid. The frame work of one of the huge doors will be constructed so that it will run along this track as the traveling crane for the erection of the trusses. Every possible fire protection will be given, and the many skylights will protect the framework in case of an accidental explosion of a ship. As soon as the helium plant at Fort Worth, Texas, is completed, the use of hydrogen with the accompanying dangers will be discontinued.

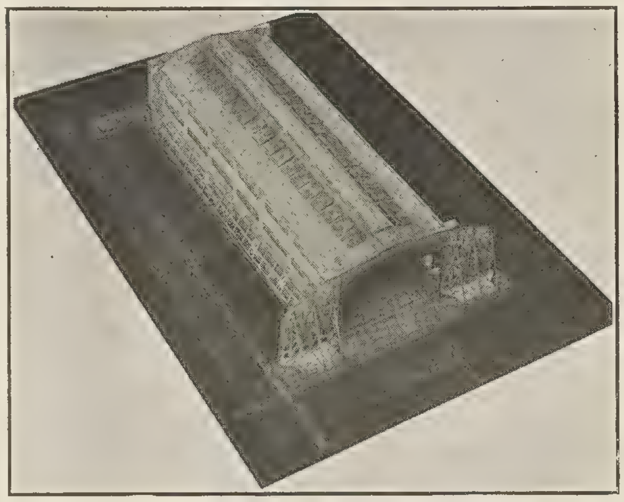
The building will hold one 10,000,000 cubic feet ship with two smaller ones on either side of 5,000,000 cubic feet.

The pair of doors has an elliptical outline on the top, and the roof is so curved that when these doors are open the silhouette of the building will be a larger ellipse of graceful lines.

This structure was designed by the Bureau of Yards and Docks, under the direction of Commander Kirby Smith, C. E. C., USN.

Great Britain's Prizes

Details and the rules for Great Britain safety competitions, confined to planes and engines built in the British empire, the announcement of which was published in last week's AIRCRAFT JOURNAL have been made public by the Air Ministry. According to present plans, entries will close December 31 of this year, while it is intended to begin the trials on March 1, next year, and prizes totaling $320,000 are offered. The airplane competitions will be for two classes, a type with a total carrying capacity of two persons, including one pilot, and a large type with accommodations for fifteen persons, exclusive of the crew.



9,000 TONS OF STEEL IN THE HANGAR

Other rules are that the small type airplanes must be able to fly at a level with a full load at or above 100 miles an hour. The small type must land in a 175-yard circle and the large type in a 275-yard circle. All must cruise for five minutes without the use of controls or stabilizing devices and stand unfastened in a ten-mile wind.

Parachutes must be carried for all float seaplanes or boat seaplanes, which will have to seat four persons, exclusive of the crews, take off from the sea with a full load, and clear an obstacle twenty-five feet above the sea level in 300 yards or less from the rest.

They will also have to alight on land over a twenty-five-foot obstacle and stop within 400 yards in a straight line. The rising from the land will be over the same obstacle. Each contestant must fly for five hours not less than seventy knots with a full load and must also ride out twenty-three hours unattended at mooring buoy.

Nine prizes are offered. Three of $80,000 are for two-seaters which must have speeds ranging between forty and one hundred miles an hour, and which must make two flights lasting three and one-half hours, carrying fuel enough for 450 miles in addition to a load of 440 pounds. There are three other prizes for larger machines, aggregating 32,000 pounds. These machines must average forty-five to ninety miles an hour, carrying fifteen passengers in continuous flights of seven hours. There are three prizes for seaplanes carrying four passengers and crew, and capable of climbing 350 feet the first minute.

Goliath Safe at Dakar

The French airplane Goliath with eight on board, en route from Paris to Dakar, Africa, believed to have been lost on the last leg of the flight, landed safely with a broken propeller north of the latter city.

The Goliath left its airdrome near Versailles Aug. 11 and arrived at Casablanca, a distance of 1,200 miles, the same day. It was commanded by Lieutenant Bossoutrot. After taking on machine guns, revolvers and rifles to be used against savage tribes if necessary, the Goliath left Casablanca on Aug. 14 for Dakar, a distance of 1,600 miles. It was forced to land at Mogador after crossing the Sahara. Since it left Mogador the only word received from it was a wireless message picked up at Dakar which indicated that the airplane was within sixty miles of Dakar.

The attempt to fly from Paris to Dakar has caused misfortune to other French aviators. Lieut. Jean Fontan four times started from Paris for Dakar. Three times he landed in France and the fourth time, on June 10, he was forced to land near Zaragossa, Spain, because of engine trouble.

On May 25 Lieut. Roget, on the first leg of a projected trans-Atlantic flight by way of Dakar to Brazil, landed at Kenitra, near Rabat, Morocco, a distance of 1,116 miles from Paris.

THE DOORS ARE EACH 131 BY 177 FEET

Lieut. Lemaitre and Adj. Guignard on June 19 arrived at Casablanca from Paris after an enforced stop near Madrid. After several days' delay the aviators arrived at Mogador. On June 26 their machine was smashed when they were forced to land at Port Etienne, Mauretania, 450 miles north of Dakar. Lieut. Lemaitre had intended to attempt to fly across the Atlantic if he had reached Dakar.

Land on Jungfrau

Aviation Lieutenant Aikermann, accompanied by Major Isler of the Swiss army, effected a landing on the summit of Jungfrau Aug. 18.

The point where their biplane was to have landed was marked by cinders in the snow, but the machine dropped into an air pocket and fell in deep snow 100 yds. away from the landing place. The aviators were not hurt.

Licenses Not Needed

President Wilson has revoked the proclamation requiring civilian fliers to apply for permits to the Joint Army and Navy Board on Aeronautic Cognizance Board.

These licenses contained a clause stating "This license is not evidence of pilot's qualifications nor the reliability of aircraft used."

Locating Food

By making an airplane flight of 125 miles, an agent of the Department of Justice discovered twenty-seven carloads of foodstuffs at Key West, en route to Cuba, reported the find, and the shipment was held up for instructions from Washington.

The flight was made after the agent, M. F. Bobst, was informed that thirty-seven carloads of food passed through Jacksonville last week on its way to Havana.

News of the Army and Navy Air Services

Hartz Bomber Ready

The "Round-the-Country" Martin Bomber which was held up near Lake Placid, N. Y., after a forced landing on its flight from Augusta, Me., to Cleveland, O., is ready to continue its flight.

The bomber made excellent time on its first two legs from Washington to Mineola, L. I., and from there to the Maine capital. Bad weather and fog caused the landing in the Adirondacks.

Lieut.-Col. R. S. Hartz commands the crew of five on board the plane.

Inactive R. M. A.'s Fly

The Commanding Officer at any Air Service station where flying is authorized may permit qualified Reserve Military Aviators, who are in inactive status, to take such flights in Government aircraft as he deems advisable. Cross-country flights will not be made under this authority and no interference with the regular training or the operation of a station will be permitted.

Before exercising the authority given them in preceding paragraph, Commanding Officers of Air Service stations will be held responsible that the following conditions have been fulfilled.

(*a*) That individuals applying for such permission have fully and completely identified themselves—documentary evidence being required when necessary.

(*b*) That such individuals have demonstrated to the Flight Surgeon that their physical condition is satisfactory for solo flights.

(*c*) That no applicant is permitted to fly solo until he has been reported by a qualified instructor as competent to do so after an actual test in the air.

The foregoing restrictions have been found necessary as a result of the experience gained to date relative to flying engaged in under authority of Orders No. 30, O. D. A. S., 1919, which has been rescinded by this order. Commanding Officers are directed to observe the spirit as well as the letter of these instructions to the end that Government property may not be needlessly destroyed nor the lives of over-enthusiastic pilots in poor physical condition, or whose flying efficiency has been lowered by too long an absence from flying, be needlessly endangered.

Planes in U. S.

The Air Service reports a total of 9204 planes in the United States, 858, or nine per cent of which, are in commission. The table shows the status of these planes as of August 7. The item in reserve includes planes of all types, foreign and domestic, in storage and at depots.

Status.	*Number.*	*Per cent. of Total.*
In reserve	7,369	80
Out of commission	977	11
In commission	858	9
Total	9,204	

NC-4 to Atlantic City

The NC-4 is to be brought to Atlantic City, it is reported, as the result of arrangements effected between Lieut.-Commander Albert C. Read and other representatives of the Navy Department and George F. Francis Kerr, Chairman of Aviation of the Atlantic City Chamber of Commerce. Accompanied by a flotilla of the patrol type of seaplanes and preceded by a destroyer, the NC-4, under the command of Commander Read himself, is due to arrive the latter part of September, and will remain several days.

Personnel Reduction

The personnel of the Air Service reached the low figure of 16,991 on Aug. 7. Of this number 3,426 were commissioned officers and 13,565 enlisted men. On Nov. 11 last there were 6,483 flying cadets, 20,554 commissioned officers and 167,986 enlisted men, a total of 195,023. This is a reduction of 91 per cent.

Of the 15,646 commissioned officers discharged from the service, 1,638 flying and 1,524 non-flying officers have entered the reserve.

Since April 1 there have been 37 fatalities at flying fields in 10,000 flying hours not chargeable to training. This shows a fatality rate of 269 hours per fatality as compared with 3,149 hours per fatality for all flying during the last five months of the war.

Forest Fire Patrol

For the week ending Aug. 16 2,602 miles of flying were covered at Rockwell Field, seven trips being made in 1,735 minutes. The officers participatiug were Lieutenants M. N. Clark, T. V. Foster, F. R. Gilbreth, Joseph E. Loughead, W. R. McKenzie, Cecil P. Connelly, Louis L. Gowans, George A. Wright, Dal M. King, Gerald G. Martin, C. W. Marsh, Sergeant John Meller. Three fires were discovered.

The Angeles National and Cleveland National were the forests under observation by the officers at March Field. For the week ending Aug. 16, thirteen flights were made covering 1,275 miles in thirteen hours fifteen minutes. Lieutenants Rufus J. Pilcher, Harry F. Colliver, J. T. Morris and Sergeant John G. Montijo participated in the flights. Two fires were reported during the week. R. T. Charlton, Forest Supervisor, stated that airplane fire patrol is the most effective system of fire detection that they have had at their disposal.

Five fires were reported to the Forestry Service at Placerville by the Mather Field Forest Patrol pilots, who during the course of the week flew 2,854 miles over Tahoe, Eldorado and Stanislaus Forest, flying at an average altitude of 6,500 feet, and making eighty-seven flights. Forest patrols in Oregon operated from Salem and made 28 flights covering 2,730 miles, with a total of 54 hours 10 minutes time. These patrols covered the Cascade Range on the East Coast and the same range on the west side. A total of 45 fires were discovered during the week ending Aug. 16, 1919, by patrols from Mather Field, making a total of one hundred thirty fires since this work was started.

Captain Thomas D. Jordon, Charles L. Hayward, Lieutenants Helmar B. Hocde, Marion A. Baldwin, William E. Riley, Harry A. Burdick, M. S. E. Leroy Richards, Leon Armour, and Sergeants John W. Jackson, Clifton Johnson, and Robert H. Gray were the officers and enlisted men participating in the flights in observing for forest fires in the Sandimas and Sangabriel Forest Reserves for week ending Aug. 16 at Ross Field. A 37,500 cubic foot capacity observation balloon was used, maintaining an altitude of 2200 feet, the total time in air being 2,265 minutes.

Air Service Filled

Men are no longer accepted for enlistment in the United States Air Service, according to Adjutant General Harris. Those already accepted for service in the aviation branch will be assigned to duty there.

On the Border

Airplanes have been playing a prominent part for the American punitive expedition that has been pursuing Renteria's band of bandits, who held Lieut. Paul H. Davis and Lieut. Harold G. Peterson for ransom.

Liaison with the American side of the border was maintained by planes while Lieut.-Col. Royce arrived at Marfa, Texas, in an airplane from the headquarters of the Southern Department Air Service at San Antonio. He planned to cross to Mexico in an airplane to make observations and inspect the work done in the Big Bend district.

American officers in a plane were fired at by Mexicans, and returned the fire, killing one, while they were unhurt.

On Border Service

With Lieut. Rex Stoner, flight commander and Capt. D. W. McNabb, commanding officer, as passenger, leading ship No. 1, Flight "B" Eighth Aero Squadron, has left Kelly Field for border duty at Laredo, Texas. Ships were flown in V-formation entire distance of one hundred eighty miles.

The following units are now operating as border patrol flights:

McAllen, Texas—Headquarters and "A" flight, 8th Aero Squadron.

Laredo, Texas—"B" flight, 8th Aero Squadron.

Marfa, Texas—"A" flight, 11th Aero Squadron.

El Paso, Texas—Headquarters 1st Bombardment Group; headquarters and "B" flight, 11th Aero Squadron; headquarters and "B" flight, 96th Aero Squadron.

Douglas, Arizona—"A" flight, 96th Aero Squadron.

Fleet Officers Fly

France Field was recently visited by Admiral Wood, commanding the Chicago, Denver, Cleveland and Tacoma, and his staff. This is the first section of the Pacific fleet to arrive at this field. The Admiral and three other Naval officers were given a flight across the Isthmus in DeHaviland 4 planes, flying in formation. Admiral Wood enjoyed the trip immensely and was perfectly "at home" in the plane, using every minute of the flight in keen observation of the Canal.

Cross Continental Divide

The first planes to go over the Continental Divide were members of the Ellington Field Transcontinental Recruiting Squadron, pilots Lieut. E. W. Killgore, Lieut. C. V. Rugh, Lieut. E. H. Nelson, and passengers Sergt. A. M. Albert, Sergt. T. Vierra, Sergt. G. W. Anderson, and Electrician J. J. Kelly. The party flew in four De Havilands from Islenwood Springs, Colo., to Denver, 130 miles, in 80 minutes. The highest altitude reached was 16,000 feet.

Air Police Perform

New York's Police Reserve Air Service gave an exhibition at the old home week celebration at Hillsdale, N. J., last week. Two Curtiss biplanes from Roosevelt Field went through stunts in the air and demonstrated combats and target practice.

Messages were dropped from Rodman Wanamaker, Special Deputy Police Commissioner, in charge of the aerial forces, and Commissioner Enright to the Mayors, chiefs of police and others in Bergen County.

Tremendous Strides in Commercial Aviation Abroad

British Manufacturers Already Operating on Peace Time Basis, Says F. G. Diffin, Just Returned from Conferences in London

That tremendous strides in commercial aviation abroad are actually being made is emphasized in the statement made by F. G. Diffin, president of the United Aircraft Engineering Corp. who returned Aug. 24 on the steamship *Baltic* from Liverpool. Mr. Diffin has been in England for the past six weeks studying the latest types of foreign airplanes and conferring with London bankers and airplane manufacturers with a view of establishing international commercial aviation relations.

"British manufacturers are already operating on a peace time basis," said Mr. Diffin, "and the encouragement they have received from their government has prompted them to push their work on commercial type machines as rapidly as possible. They have received sufficient orders for the war type planes to allow them to retain their factory organizations, which would be impossible without the support of the government.

"This is made possible by the appropriation of $350,000,000 recently made by the British for aeronautics, but substantial prizes that have been put up for airplane competitions have also been a source of encouragement to the manufacturers, dealers and owners of airplanes and has kept the public interested in aviation development. The competitions are conducted in such a way as to best demonstrate the utility of aircraft and the feasibility of using them as cargo carriers covering long distances. Airplanes are now being built in England carrying 40 people and these are being built by commercial concerns and will be used solely for commercial purposes.

"Dirigibles five times as large as the R-34 are approaching completion and will be used in regular colonial service within eighteen months connecting Great Britain and her colonies. Today the aviation business in England is higher in the matter of expenditures than the automobile business—a condition that will eventually obtain in the United States.

"The fact that the airplane has successfully covered long distances proves that it is a competitor of the railroad and not of the motor car as some would seem to think. There is no question in my mind but what we will see an air route operating between New York and Chicago on regular schedule, and this will come by the spring of 1921. The best evidence that such routes are bound to come is the fact that transportation development has never moved backward and as the man on horseback succeeded the pedestrian, and as the motor car succeeded the stage coach, so will the airplane succeed the railroad train in the matter of speedy transportation. While there may continue to be prejudice, still when one thinks of the resistance motor car manufacturers had to overcome to convince the people that the automobile was a practical vehicle, the problems that confront those who are developing commercial aviation do not seem nearly as big.

"England, by adopting aerial laws governing Civil Aerial Transport has taken a big step in the right direction. We should make similar laws in the United States immediately rather than to leave it to each state whose laws would probably be based on a series of judicial decisions, which would obviously retard the industry.

"If the success of the British manufacturers who are marketing airplanes as fast as they can make them can be taken as a criterion, then the United States market will easily absorb several thousand machines next spring and summer if they can be built. Whether or not they will be built by that time will depend largely on the support the manufacturers are given by the Government as they must have definite orders for at least a small number of machines for Government use in order to help finance the production of commercial type planes and to keep their organizations intact.

"I firmly believe that next spring will see a repetition of the early automobile days with the demand far in excess of the supply and new types and models being rapidly perfected.

"By next spring we will also see scores of municipal landing fields and airdromes in operation, which will increase the scope of the civilian flyer tremendously. Many of these are now being constructed and they, in themselves, are conclusive proof that the public has accepted the airplane as a means of quick and safe transportation that has demonstrated its efficiency and time-saving features hundreds and hundreds of times."

Olympic Air Race

Army fliers will circle William Penn's statue on the Philadelphia City Hall tower as the turning point in the aviators' race which will open the American service men's Olympic tournament at Camp Dix Saturday, Sept. 6. This extension of the course, originally laid to Trenton and return, has been announced by Frank Wandle, general director of the meet, after a conference with aviation officers.

President Wilson and Secretary of War Baker have been invited to Camp Dix to attend the tournament and the latter will be asked to fire the starter's gun that will send the big planes off the mark at the aviation field.

The air course as finally agreed upon will be triangular. Starting at the camp, the planes will fly to Trenton, around the State House dome and thence by air-line to Philadelphia, where they will circle the statue and start on the return trip, flying up the Delaware as far as Burlington, where they will cut directly inland to camp. The finish will be across camp headquarters.

The race will be open to all Army aviators now in service or who served during the war. To add personal interest to the contest for spectators, each contestant will fly his own colors in streamers attached to the tail of the machine. Four Army entries are already assured for the event.

While the aviators are contesting a small army of soldier athletes will be meeting in the most ancient of athletic contests—a marathon footrace, which will be run over a twenty-mile course from the State House at Trenton to the camp athletic field.

The Olympic will be conducted by the Knights of Columbus.

Bolivians Buy Wasp

The Bolivian government has purchased a Curtiss Wasp—the machine in which Roland Rohlfs, Curtiss test pilot, recently established a new American altitude record. It is equipped with a Curtiss Twelve 400 H. P. motor and overhanging wings. It will be used for training purposes. The Wasp was built as a two-place fighting machine and has a record of 160 miles per hour and a climbing record of 16,000 feet in ten minutes. It is exceptionally adapted to work in high altitudes.

France's Activities

Figures have been published in the *Petit Parisien* concerning France's efforts to provide her flying corps with materials.

In 1915 France built 3460 airplanes; in 1916, 7552; in 1917, 22,751, and in the first nine months of 1918, 34,219.

Airplane factories employed 12,650 workers on January 1, 1915; 30,950 on January 1, 1916; 68,920 on January 1, 1917; 131,551 on January 1, 1918, and 186,003 on November 1, 1918.

Selling by Air

The first drummer to travel by air, Roland Bassett, star man for an overalls house, booked $10,000 worth of orders in a flight from New York up the Hudson as far as Poughkeepsie and back, which occupied altogether only four hours.

C. Nicholas Reinhardt, General Passenger Agent of the Travelers' Company, which operates a flying boat line between New York and Atlantic City, originated the idea of adopting the heavier-than-air machine to the needs of commerce, and Bassett's employers, Sweet, Orr and Co., were enthusiastic about its possibilities when he got safely back with his orders.

C. J. Zimmermann was the pilot.

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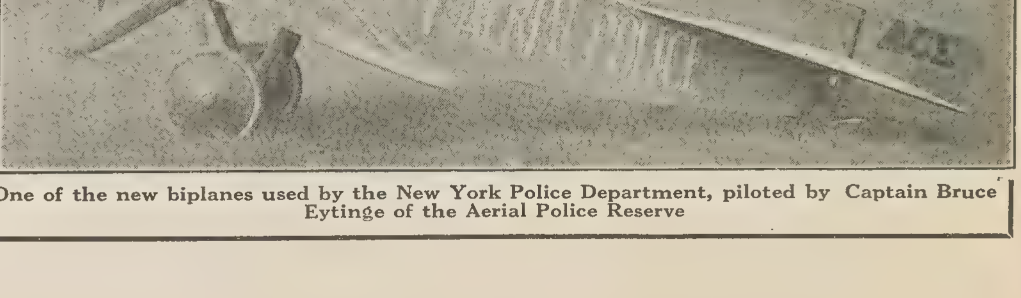
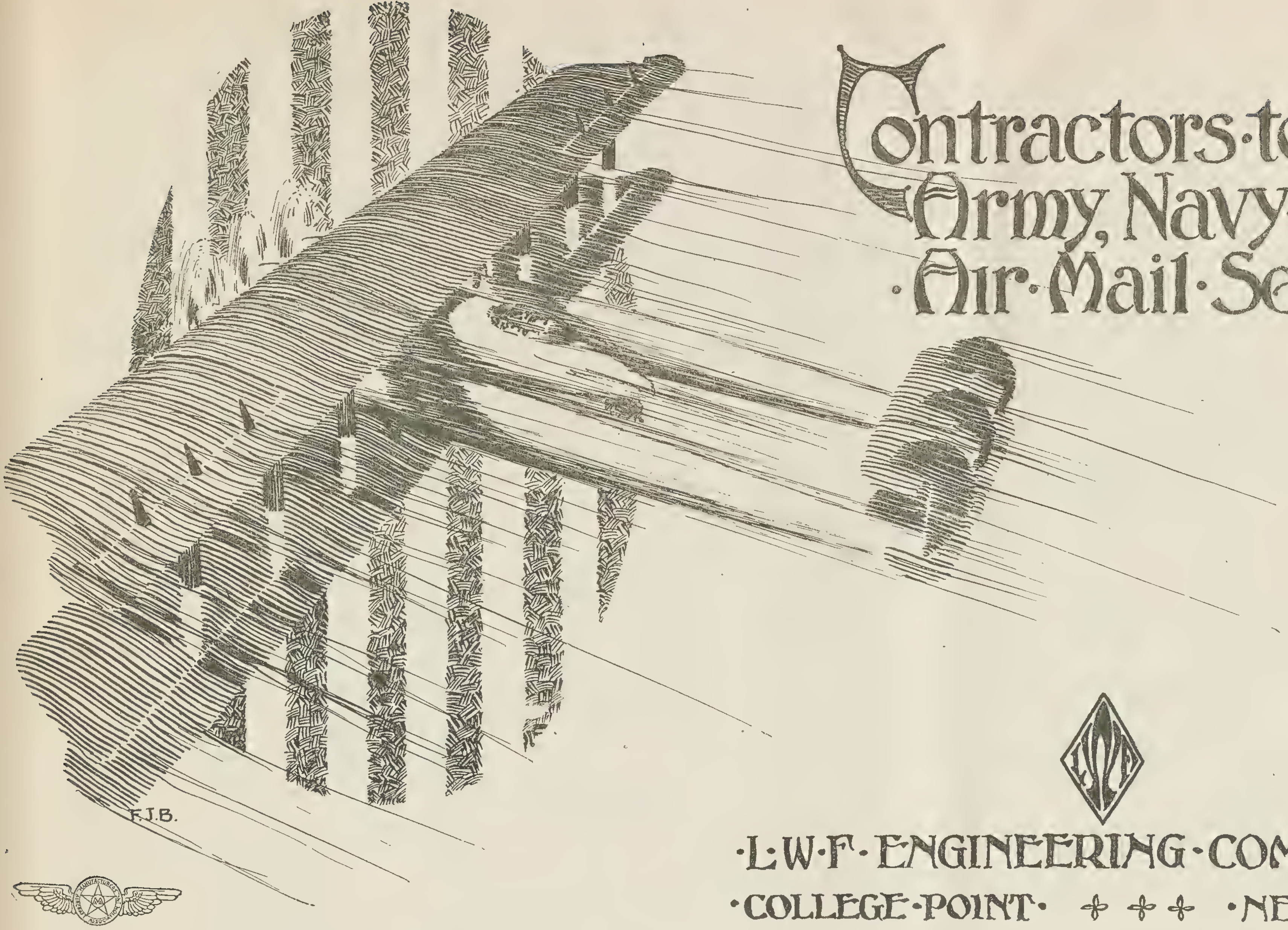


One of the new biplanes used by the New York Police Department, piloted by Captain Bruce Eytinge of the Aerial Police Reserve



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London-Paris Service

A new freight and passenger airplane service between London and Paris was inaugurated Aug. 25. The results of the first day's operation show that this means of communication is entirely satisfactory and far more comfortable and speedy than the old systems.

The airplane 4-A left London at 9.08 o'clock and returned at 2.45, completing the round trip in five and three-quarter hours. Two firms have started daily flights simultaneously, charging $75 to $100 single fare. Considering the advantages, these prices are not held to be exorbitant. Great hopes are held out that these fares will be reduced as operating conditions become better, and with bigger, better planes capable of carrying heavier loads.

These planes carry one ounce of mail for $1. As it is possible to send 5000 words for this sum, the rate is considered cheap. Cable tolls to Paris average 5 cents a word, and the airplane men say they will soon be able to beat the cable. The manufacturers say they have plans for reducing the time between the two cities to one hour, and that this may be realized in one year.

New Zeppelin Flies

A new Zeppelin airship, on its maiden trip from Friedrichshafen to Berlin, covered the 435 miles is named *Bodensee*, attained a maximum speed of 75 miles an hour.

The builders of the new type of machine have discarded the familiar cigar shape of the old Zeppelins and adopted a conical-outlined exterior.

The *Bodensee* is 120 meters long and accomodates thirty-five passengers. It is equipped with wireless telegraphy and has a spacious passenger cabin. The passengers are able to obtain running hot and cold water. The aircraft is to go into a daily service.

Peace Treaty Convention

(Continued from page 6)

ject of a special agreement contained in Annex H to the present Convention.

Nothing in the present Convention shall be construed as preventing the contracting States from concluding, in conformity with its principles, special protocols as between State and State in respect of customs, police, posts and other matters of common interest in connection with air navigation.

ARTICLE 38.

In the case of a disagreement of two or more States relating to the interpretation of the present Convention, the question in dispute shall be determined by the Permanent Court of International Justice to be established by the League of Nations and until its establishment by arbitration.

If the parties do not agree on the choice of the arbitrators, they shall proceed as follows:

Each of the parties shall name an arbitrator, and the two arbitrators shall meet to name a third. If the arbitrators cannot agree, the parties shall each name a third State, and the third State so named shall proceed to designate the third arbitrator, by agreement or by each proposing a name and then determining by lot the choice between the two.

In case of the disagreement of two or more contracting States relating to one of the technical regulations annexed to the present Convention, the point in dispute shall be determined by the decision of the International Commission for Air Navigation by a majority of votes.

In case the difference involves the question whether the interpretation of the Convention or that of a regulation is concerned. final decision shall be made by arbitration as provided in the first paragraph of this Article.

ARTICLE 39.

In case of war, the provisions of the present Convention do not affect the freedom of action of the contracting States either as belligerents or as neutrals.

ARTICLE 40.

The provisions of the present Convention are completed by the Annexes A-H. which have the same effect and come into force at the same time as the Convention itself.

ARTICLE 41.

The British Dominions and India are deemed to be States for the purposes of the present Convention.

Protectorates, or territories administered by the League of Nations or placed under its control are, for the purposes of the present Convention, deemed to form part of the Protecting or Mandatory States, both as regards their territory and as regards their nationals.

ARTICLE 42.

The present Convention shall come into force as between any of the contracting States as soon as such States shall have exchanged ratifications, which shall take place within one year.

The ratifications shall be deposited in the archives of the Ministry of Foreign Affairs of the French Republic.

ARTICLE 43.

The States which have not taken part in the present war shall be admitted to adhere to the present Convention upon their simple declaration notified to the Ministry of Foreign Affairs of the French Republic, which shall inform the contracting states of such adherence.

ARTICLE 44.

Any State which took part in the present war but which did not take part in the negotiation of this Convention may express its desire to adhere to this Convention and may be admitted to adhere to it, if such State is a member of the League of Nations or, until January 1st, 1923, by a unanimous vote of the signatory and adhering States or, after January 1st, 1923, by an affirmative vote comprising at least three-fourths of the total possible votes of the signatory and adhering States, the votes of the different States having the same weight as that provided by Article 35 of this Convention for the International Commission for Air Navigation.

The Ministry of Foreign Affairs of the French Republic shall receive requests for adherence to this Convention under the conditions provided by this article, shall communicate them to the contracting States, shall receive the votes of the contracting States and shall announce the result of the vote.

ARTICLE 45.

The denunciation of the present Convention shall take effect with regard only to the State which shall have given notice of it. Such notice shall not be given before January 1st, 1922 (nineteen hundred and twenty-two) and the denunciation shall not take effect until at least one year after the giving of notice.

Notices under this article shall be given to the Ministry of Foreign Affairs of the French Republic which shall communicate them to the contracting States.

Done at Paris, the *day of* 1919, *in the English and French languages, which shall be of equal validity an authority, in a single copy which shall remain deposited in the archives of the French Government, and duly certified copies of which shall be sent, through the diplomatic channel, to the contracting States.*

(To be continued)

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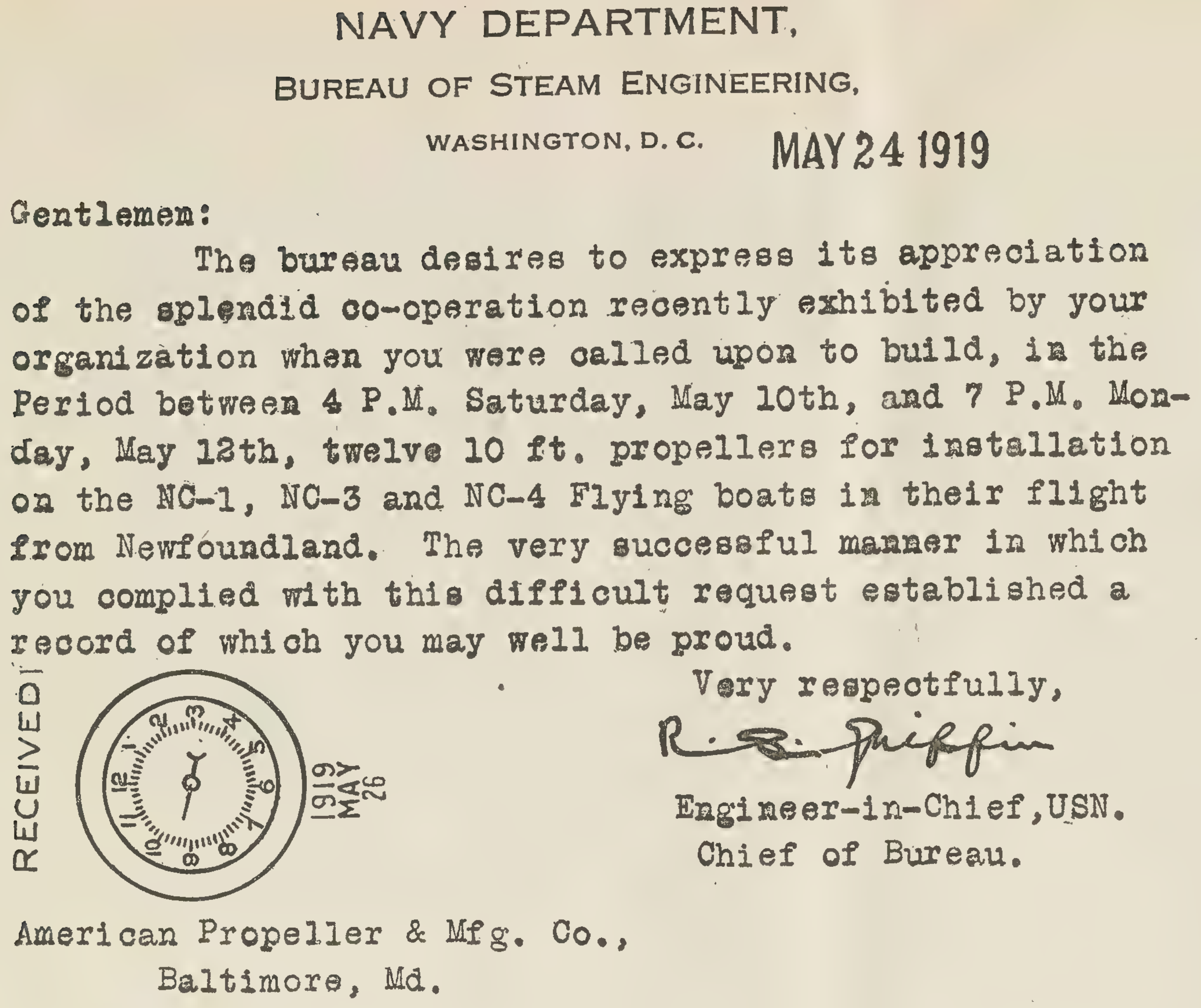


NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
WASHINGTON, D. C. MAY 24 1919

Gentlemem:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

Very respectfully,
R. S. Griffin
Engineer-in-Chief, USN.
Chief of Bureau.

RECEIVED 1919 MAY 26

American Propeller & Mfg. Co.,
Baltimore, Md.

THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
ITHACA, N.Y. U.S.A.

Suit Dismissed

Judge Augustus N. Hand of the United States District Court signed a final decree Aug. 20 dismissing the suit brought by the Curtiss Aeroplane and Motor Corp. against the United Aircraft Engineering Corp. of New York. Previous request for an injunction had been denied and the present decree terminates the suit and permits the United Aircraft Engineering Corp. to continue the sale of airplanes without interference.

Several months ago the United Aircraft Engineering Corp. purchased several hundred Canadian training planes and a large quantity of spare parts from the Imperial Munitions Board of Great Britain. The Curtiss Aeroplane and Motor Corp. claimed that these machines were infringements on various models made and sold by them and on which they claimed to hold patents, but evidence introduced in court disclosed the fact that the arrangements between the Canadian Aeroplanes, Ltd., of Canada, makers of the planes, and the Curtiss Aeroplane and Motor Corp., and the arrangements between the Imperial Munitions Board and United Aircraft Engineering Corporation were such that these machines may be sold in the United States without interference.

Lytle Has New Firm

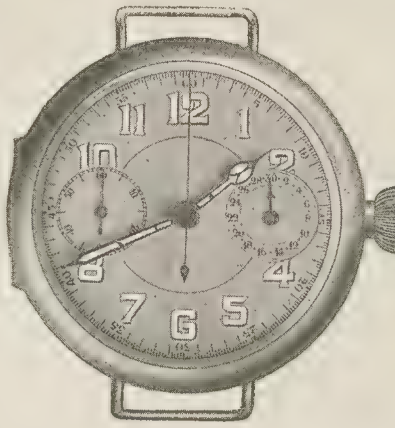
J. Horace Lytle has formed the J. Horace Lytle Company, advertising, with offices in the Mutual Home Building, Dayton, Ohio. Prominent Dayton interests are associated with Mr. Lytle in his new company.

Northwestern Aircraft Co.

Foster Russell, engineer, has purchased an interest in the Northwest Aircraft Co. of Spokane, and has been elected general manager. He is a graduate aviator. The company has purchased a new airplane for delivery before the end of August.

Wrist Chronographs

Lieut.-Commander Albert C. Read who piloted the NC-4 across the Atlantic wore throughout his trip an aviator's wrist chronograph supplied by the Knickerbocker Watch Company of 233 Broadway, New York. While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.


WRIST CHRONOGRAPH

In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships. Lieut.-Commander Richard E. Byrd says:

"The chronographs were used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals."

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

These accurate instruments are of silver in two sizes, the smaller with khaki web strap with patent silver clasp, and the larger with adjustable leather strap and guard so that the watch may be worn over flying togs if desired. The hands and figures have a luminosity guaranteed for two years. The watches have 18 jeweled lever movements adjusted to position and temperature, and the manufacturer claims no variation up to 5,000 feet.

Planes Find Timber

Cruising in airplanes over Labrador has disclosed great timber lands from which millions of cords of pulp wood could be cut and rolled to streams for direct shipment, members of a Boston expedition which spent the past month there declare. The expedition was forced to halt on its return when the steamer *Granville* struck an iceberg and experienced boiler trouble in the Gulf of St. Lawrence.

Capt. Daniel Owen, R. A. F., is head of the expedition, which comprised twenty persons, among them five aviators, and operated seventy miles north of Battle Harbor. Two million acres of timber land were explored by air and by the ordinary methods of timber cruising. Pictures taken from the air, numbering 14,000, were said to show dense growths of pulp material in such manner that the most available places could be determined readily. The planes cruised inland for more than 100 miles.

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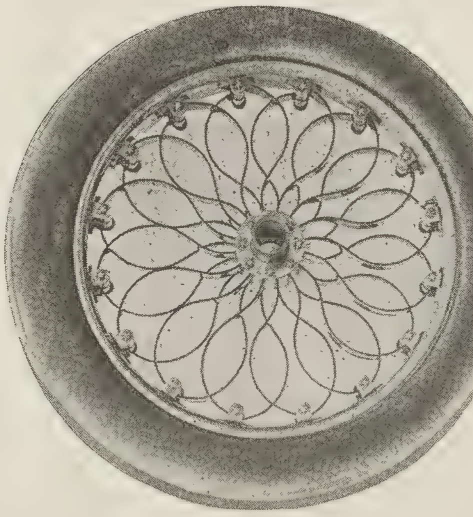

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ANSWERS TO CORRESPONDENTS

Inquiries on aeronautical or allied subjects will gladly be answered by the editors of AIRCRAFT JOURNAL by letter to the inquirer and included in these columns. Questions to be answered by mail should be accomplished by stamped addressed envelopes.

Training for Aeronautics

Inquiry—Has an experienced automobile mechanic training suitable for aeronautics?

P. J. K.—A man who is qualified as a skilled mechanic and a good automobile and gas engine man has certainly a good preliminary training for getting into the aviation game, but at the same time it would be very difficult to get a job.

It would be well to consider the opportunities offered by the Air Service. A man would get there interesting experience, together with possibility of flying. Their terms of enlistment should be given very careful consideration.

Civilian Licenses

Inquiry—How may I secure a license for flying? I am a civilian but am a member of the Reserve.

H. M. T.—To secure a license for civilian flying, you should apply to the office of the Joint Army and Navy Board of Aeronautical Cognizance, Building D, Sixth and B streets, Washington, D. C., addressing Lieut. A. J. Clayton.

There seems to be no reason why your being in the U. S. Reserve should interfere with civilian flying.

Courses in Aeronautics

Inquiry—Do any colleges in New England offer courses in aeronautical engineering?

A. M. K.—The Massachusetts Institute of Technology has a distinct course in aeronautical engineering, which was a post-graduate one until the beginning of the war.

Openings for Pilots

Inquiry—I was an Army pilot and ask if you know of any positions available.

E. P. K.—There are many more Army pilots available than positions open. Application might be made to the Aerial Mail Service, Washington, D. C., who may have an opening. It might be advisable to write to all the airplane manufacturers and transportation companies, whose addresses would be supplied at this office. There will be considerable difficulty, however, in finding a suitable post just at the moment.

Index to Aviation

Inquiry—In the August 1 number of AVIATION AND AERONAUTICAL ENGINEERING is a list of or index of Volumes I to VI, in which I am interested. Can you tell me where and at what prices I can purchase same? Also the book "Aeronautical Engineering and Airplane Design?" Where can this be secured? What schools teach Aeronautical Engineering in the United States?

E. W. G.—Volumes I-V of AVIATION AND AERONAUTICAL ENGINEERING can be obtained from the publishers, but Volume VI is of course not yet complete. Volume I sells for $25.00, Volume II for $10.00 and the others for $5.00 each. The book "Aeronautical Engineering and Airplane Design" can be purchased from the same publishers, who also publish AIRCRAFT JOURNAL. Aeronautical engineering in the U. S. A. is taught at Massachusetts Institute of Technology, Cambridge, Mass., and also at the University of Michigan at Ann Arbor, Mich. The Brooklyn Polytechnic Institute at Brooklyn, New York are contemplating a course in it this winter.

The Gasoline Motor

Inquiry—What are good books on gasoline motors and design?

A. T. B.—The following is a list of books on the gasoline motor. There is nothing available dealing exclusively with design.

"Automobile & Aero Engines," by Devillers, published by E. & F. Spon, 57 Haymarket, London, S. W. 1, England; "Aero Engines," by E. A. Burls, published by J. B. Lippincott Co., Philadelphia, Pa., and "Internal Combustion Engines," by Judge.

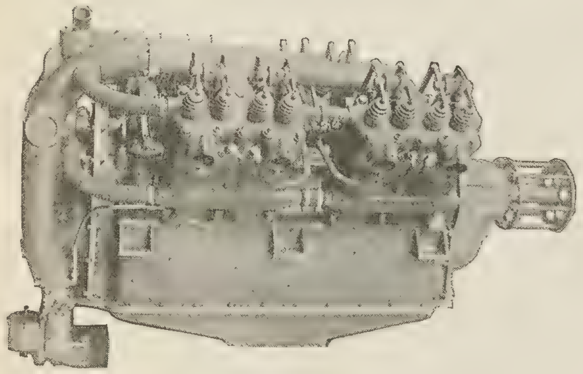
Cleveland Aviation Week

(*Continued from page* 7)

the degree to which the public has been educated to airplanes by making flights.

The purpose of the week, as initiated by the Cleveland Aviation Club, was to insure the providing of adequate aerial landing facilities in Cleveland and throughout Ohio. Telegrams sent to thirty-one cities revealed the fact that twenty-two claimed to have adequate landing fields. A tour of Ohio by a squadron of JN planes may be made early in September, the cities with facilities being the points of stoppage on the route.

The campaign in Cleveland itself promises to result in action of an encouraging sort. The Chamber of Commerce in resolutions passed August 21 recognized the inadequacy of the present facilities and requested Government assistantce. More decisive action on the part of the city will be necessary, and it is thought that the two ground accidents which the Martin Bomber and the U. S. Aerial Mail plane suffered August 22 on account of the limited run offered by the mail field will result in some kind of civic action looking to better terminal facilities for planes.



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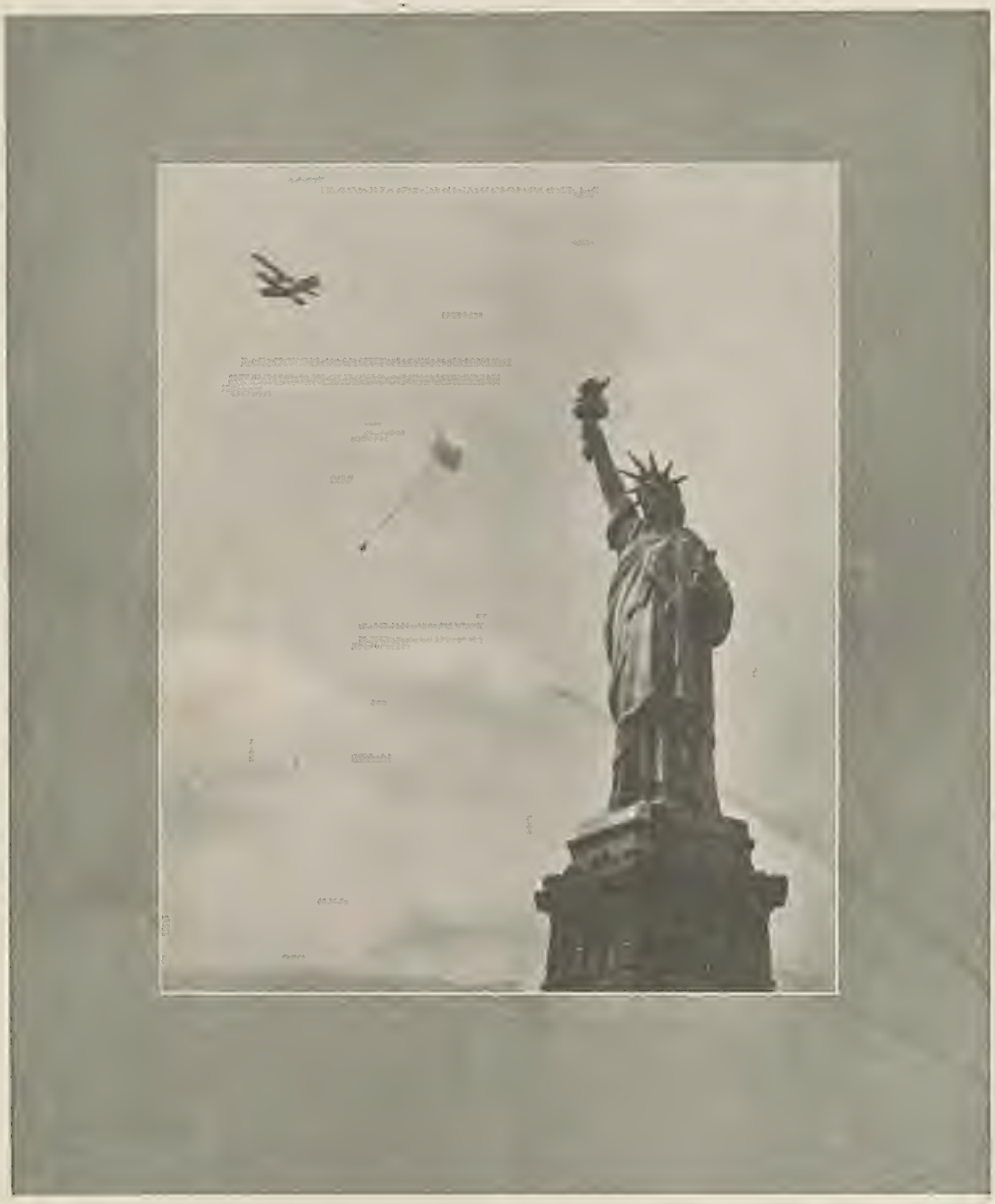
V #10

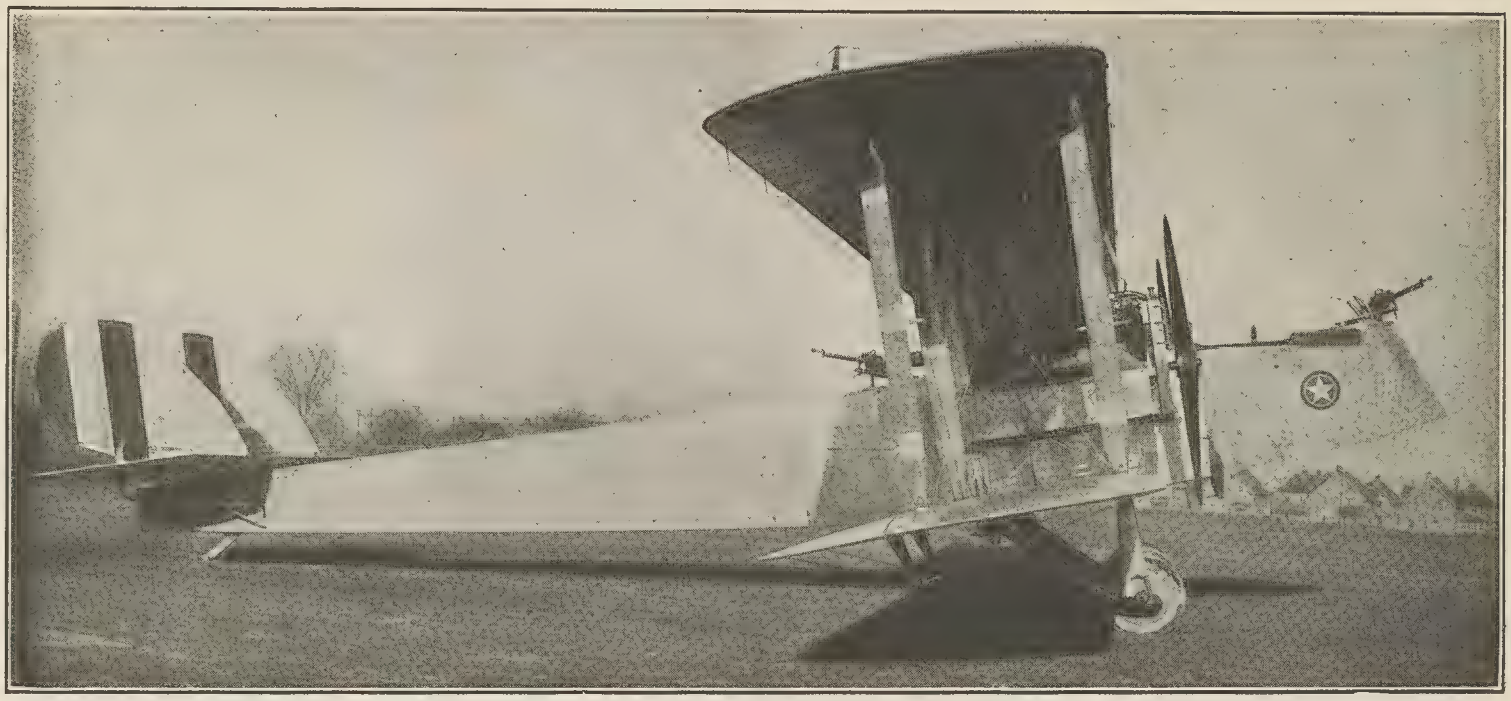
AIRCRAFT JOURNAL

September 6, 1919 Every Saturday Price Ten Cents



Graphic News Bureau

Major Orde Lees Dropping From Plane



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Aircraft Journal
Sept 6, 1919

Maynard Winner of Air Contest

American-Built De Haviland Planes with Liberty Engines Take First Five Places

Lieut. B. W. Maynard, U. S. Air Service, piloting a De Haviland-4 plane powered by a Liberty 400 hp. engine, has been declared the winner of the speed race of the New York-Toronto Aerial Derby conducted under the joint auspices of the American Flying Club and the Aero Club of Canada. Lieutenant Maynard made the 1,042 miles from Mineola to Toronto and return in 7 hours, 45 minutes and 15 seconds flying time, just a shade under 2¼ miles a minute.

Lieutenant Maynard's victory gives the best speed time to an Army pilot, an American built plane and a Liberty motor. Planes of the De Haviland-4 type—all piloted by Army officers—took the first five places in the race. Twelve out of the first seventeen planes in the final standing were De Havilands with Liberty engines.

Lieut. H. H. George, who made his start from Toronto, finished second, nearly an hour later than Lieutenant Maynard's time. Lieut. D. B. Gish, who was penalized 21 minutes for changing a propeller, was third, 3½ minutes after Lieutenant George.

The first civilian to finish was C. S. Jones, in a JN-4D. Richard H. Depew, also in a JN-4D, was second and S. S. Moore in a JN-4 third of the civilians. As the Army pilots are not permitted to participate in the money prizes offered the winners by J. McE. Bowman, of the Hotel Commodore, the awards of $1,500, $700, and $300 for speed will be awarded to the civilian winners, although they finished eighteenth, twenty-first and twenty-second in the final standing.

Lieutenant Maynard will receive the Canadian National Exposition Trophy for the fastest time for the round trip flight and the Canadian Aero Club trophy for the fastest time one way in either direction.

To Major R. W. Schroeder, U. S. A., is awarded the American Flying Club Trophy for the fastest time from Toronto to Mineola.

This is the second record that Lieutenant Maynard has made in the Army Air Service. While test pilot at the assembly plant at Romorantin, France, he looped the loop 318 times in sixty-six minutes, which was then the world's record. Since then the record has been bettered by another American flier.

Lieutenant Maynard was a student in the Baptist Theological Seminary at Wake Forest, N. C., when he entered the Air Service in August, 1917. He has two brothers in the army, both of whom served in France. He received his first training in the ground school at Columbus, O., and from there was sent to France. At Tours he received his first flying instruction from the French fliers.

Later Lieutenant Maynard went to the big aviation centre at Issoudon, and from there to Romorantin, where he was held for the rest of his time in France as official test pilot, taking up the newly assembled machines to test out their safety before they were sent to the front. He has tested as many as twenty-two machines in a single day. He is soon to be discharged from the service, and will resume his theological studies.

Lieut. B. W. Maynard, the Winner
(C) *Underwood and Underwood*

Lieutenant Maynard won the International Derby without any adjustment of any kind. He ran his motor at a uniform speed of 1,825 revolutions a minute. His fastest time was between Buffalo and Syracuse, 146 miles, covered in fifty-six and a half minutes; he flew from Syracuse to Albany, 141 miles, in forty-eight minutes.

Lieutenant George, who came in second, is an American ace and wearer of the Distinguished Service Cross, although but eleven days on the fighting line. He had been acrobatic instructor at the flying field at Tours, but got his chance eleven days before the armistice. He brought down five German machines in that time.

Lieutenant Gish, who was third, carries his leg in a brace as a result of injuries received in France. He made two circuits of the course, first as observer in the plane piloted by Lieutenant W. C. F. Brown, then as a pilot himself. On the second trip Lieutenant Brown acted as Gish's observer.

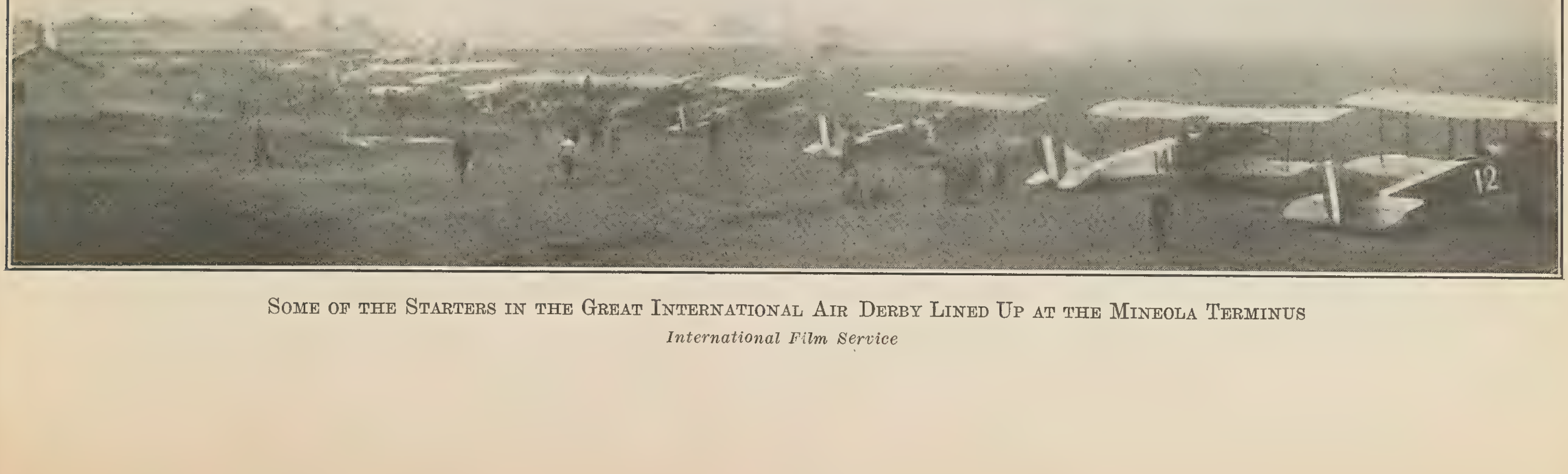
Contestants flew a total of more than 37,000 miles. Officials of the flying club consider the race proof of the reliability of the airplane, because in spite of the great strain under which the flights were accomplished, only two persons were injured. Austin B. Crehore suffered a broken arm when he crashed into a tree at Albany, and Capt. F. B. Kindley suffered bruises when he wrecked his plane on an embankment to escape hitting a crowd of spectators, also at Albany.

It was pointed out that all the contestants kept their motors going at full speed during the entire race, putting a severe strain on them than ordinary flying conditions would necessitate. Also, they flew straight through storms of rain and wind, whereas an aviator under ordinary circumstances can go around a storm.

Of the 53 planes that started the race, 32 finished—a percentage of more than 60, a reliability far exceeding that shown in most automobile events of the same character. Of the planes out of the race, four have actually flown after making minor repairs, and of those out because of crashes, only four are no longer serviceable. Seven of the machines made the round trip course twice, either as new entries with new pilots up, or as second attempts.

Credit for the success of the race is owed in a great measure to Chance M. Vought, chairman of the Contest Committee of the American Flying Club, in charge of the arrangements for the Derby. Remarkable results were attained, despite storms that beset the course during several days of the flying, and successful journeys were made despite wind, rain and lightning such as might have imperiled a stout ocean-going vessel.

Much attention has been directed since the first of the international fliers took wing to the feasibility of mail service by air between the United States



Some of the Starters in the Great International Air Derby Lined Up at the Mineola Terminus
International Film Service

and Canada. The Canadian Government issued a special stamp for such mail as was carried by fliers who started at Toronto, and there was an exchange of official letters between President Wilson and the Prince of Wales, now a visitor in Canada, and between lesser notables of the two nations.

Every aid was lent to the project by the Army Air Service, and many of the entrants came from that service, their participation being encouraged that the race might afford comparative data as to the performance of the various planes used by the Army, and between Army planes and contesting craft of other types. The War Camp Community Service aided the project by taking care of the fliers at the control stations at Albany, Syracuse, and Buffalo. A number of the American machines in the race were specially built for the flight.

Lieut.-Col. J. D. Carmody, Lieut. W. R. Taylor, Major-General Menoher, and Col. Archie Miller, Officials and a Pilot at Roosevelt Field

(C) *Underwood and Underwood*

The Roosevelt Field Control was conducted by Colonels Miller and Carmody, and cooperating with them were Messrs. Cole Younger, assistant to Mr. Vought, Frank Vernon, James B. Taylor, Jr., Roy U. Conger, Walter H. Phipps, A. L. Haustetter and Laurence LaT. Driggs, president of the American Flying Club.

At the Albany Control Stop Major R. L. Walsh was Officer in Charge of Flying while the club was represented by Ladislas d'Orcy, Commissaire Sportif, Wm. B. Stout, Technical Representative, and D. I. Lamb, Chief Timer.

The Syracuse Control Stop was run by Major M. F. Davies, U. S. A., Officer in Charge of Flying, and Edward MacShane, Commissaire, assisted by Messrs. Young and Cowles, and Gordon Murdock.

The Buffalo control stop was in charge of Major T. G. Lanpier, U. S. A., Officer in Charge of Flying and Benj. L. Williams, Commissaire, Henry Klyce, Jr., Technical Represntative and Harry McCorry, Chief Timer.

The local Chambers of Commerce and Red Cross, as well as the War Camp Community Service rendered invaluable assistance and did everything possible to make the pilots and field personnel comfortable. There were over thirty individuals at each control stop required to conduct the race, exclusive of mechanics and enlisted men.

The Toronto end of the race was most ably conducted by Edward Lowe, one of the founders of the L-W-F company, and he was assisted by Messrs. Terry, Riddell, Aspden, Sinclair and Swift, as well as by Major John Inwood and Capts. J. H. Scandreth and J. C. Suydam.

Aside from satisfaction that an American with an American built machine, and an all-American engine had made the fastest trip, flying men laid emphasis upon the stimulus to international flying, which they are confident must result from the contest. It is curious that despite the hundreds of miles of American-Canadian border there has not before been an international flight of this character.

The only other attempt at an international air journey with the United States as either starting point or objective was the effort of the Handley-Page bomber, to fly from Harbour Grace, N. F., to New York or Atlantic City, last July. This attempt ended in a crash, due to a broken oil pipe, in Nova Scotia, and the machine is being rebuilt there to complete the journey. Even this was unofficial, and the American seaplanes which engaged in the Atlantic crossing, while actually starting from Rockaway Beach, L. I., began their official flight from Trepassey, N. F., so that the contest just closed will be historic as America's first participation in an international flight with one terminus her own soil.

Lieut. A. E. Simonian flew a DH-4 and completed the trip from Mineola to Toronto and return in 713¼ minutes, and Bert Acosta flew from Toronto to Mineola and return in an Oriole machine in 778¾ minutes. Both men were disqualified for failure to circle the field at Albany, this rule being made for the safety of the flyers. Roland Rohlfs, first reported to be the civilian winner, and Serg. A. B. Coombs were disqualified for failure to encircle the Buffalo control station. Sergeant Coombs had made the return flight in 576 minutes and Rohlfs in 667¼.

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The table of winners is published on the next page.

International Air Mail

A permanent air mail service between New York and Toronto will be one of the direct results of the international air race, is the opinion of Robert J. Kennedy of the American Flying Club. He declared after the race that he had found considerable enthusiasm for such a service in Canada and in Buffalo and other up-State cities.

"Business men believe that the international race has proved the feasibility of commercial air travel," said Mr. Kennedy tonight, "and the necessity for an aerial mail route is apparent. Members of the King Street Association and the Board of Trade of Toronto are going to advocate the permanent mail route. They want Albany to be one of the cities on the route, as well as Buffalo and Syracuse."

Air mail between New York city and the principal cities of New York State is likely to be a development of the Derby. W. F. Shanahan, representative of J. McE. Bowman, called on Governor Smith, of New York, after the race, urging that the possibilities of aerial mail across the State had been proved by the air race.

Attorney General Charles D. Newton received a letter by air courier from Attorney General I. B. Lucas, of the Province of Ontario, Canada. "May this prove but one more connecting link between the banner province of Canada and the great State of New York," Mr. Lucas wrote.

London-Paris Record

Proof that commercial aviation is making great strides in Europe was strikingly demonstrated recently when one of the flying expresses in the London-Paris passenger air service made a record flight between the two capitals under adverse weather conditions in 1 hour and 50 minutes.

The machine carried four passengers and a full load of parcels, and, despite a terrific head wind, the machine reached its destination twenty minutes ahead of schedule. This flight did much to demonstrate the practically perfect safety of air travel, and shows that machines can now venture out over the Channel in any kind of weather.

Three commercial lines are in full operation between the two cities.

French firms are planning to open a vast system of airplane routes to cover the whole of France, the service between Paris and Lille being open and other routes soon to be inaugurated. The French manufacturers are working in feverish competition with the British firms in developing a type of airplane best suited for tourist purposes.

World Air Routes

The ambitious scheme for inaugurating an airship service around the world by the Great Northern Aerial Syndicate of Liverpool is well under way, and it is hoped to have the first airship in service by next May, according to current reports.

Liverpool is to be the principal jumping-off ground. The airships which the company is endeavoring to secure are of two types. The larger ones, which will only call at chief centers, are of the rigid class, capable of carrying 150 passengers.

Non-rigid airships will transport passengers from the smaller towns to the larger craft. Three routes have so far been outlined: From Liverpool to York, Hull, Copenhagen, Stockholm, Petrograd, Tomsk, Pekin, San Francisco, New York, Queenstown and Dublin.

From Liverpool to London, Paris, Cairo, Colombo, Perth and Melbourne or Sydney.

From Liverpool to Cardiff, Lisbon, Sierra Leone, Cape Town and Buenos Ayres.

Efforts are being made to acquire some of the vessels which were under construction for the Government at the conclusion of the war.

Modified DeHaviland Mail Planes Twin-Engined

L-W-F Engineering Company Has Rebuilt DH-4 to Be Powered by Two 150 Hp. Hispano-Suiza Engines

Tests have just been made of the modified De Haviland-4 airplane, rebuilt for the Post Office Department by the L-W-F Engineering Co., to provide a twin-engined machine for mail carrying. Two 150 hp. Hispano-Suiza engines have been installed in the machine, although in the final speed tests to be made soon under the direction of Capt. J. N. Foote, chief test pilot of the L-W-F Engineering Co., it is intended to substitute two 6-cylinder Liberties for the Hispano-Suizas.

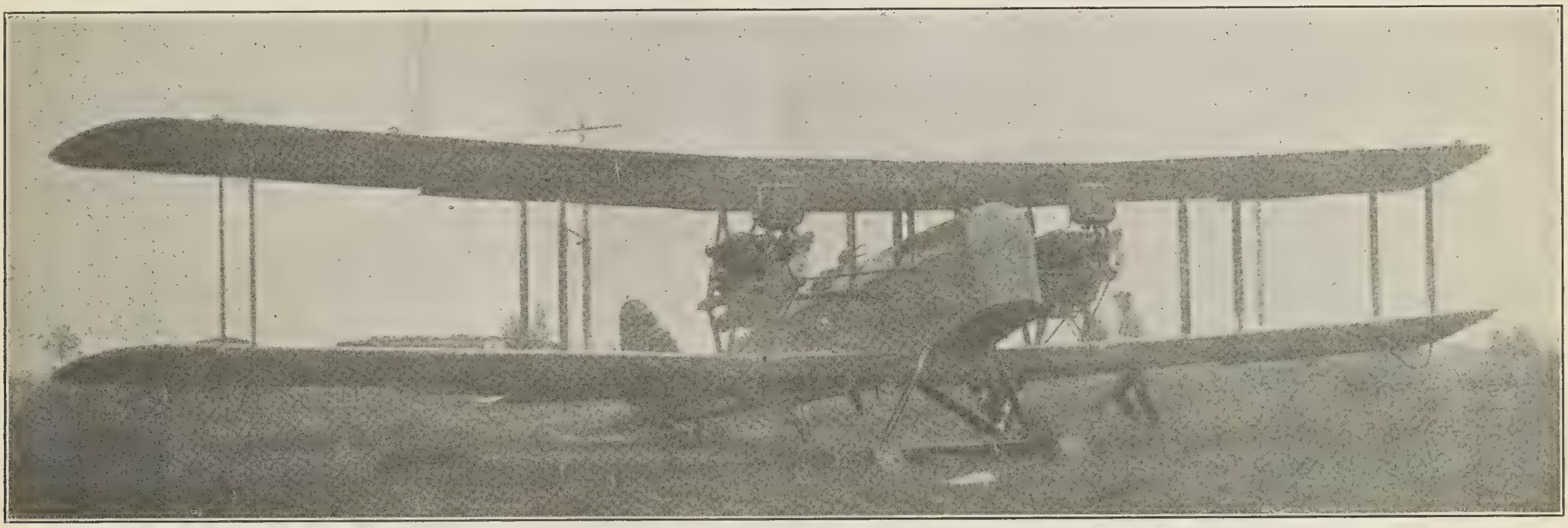
The final tests will determine whether rebuilt De Havilands will be added to the Air Mail Service equipment. The plane is designed to carry a mail load of 600 lbs., instead of the 450 lbs. possible mail load in the Liberty-12 single-engined plane.

The rebuilt plane has had its wing area increased by a larger section in the upper wing, and two center panels in the lower wing.

On test recently, piloted by Captain Foote, the twin-engined De Haviland-4 was flown with 408 lb. of sand in the front mail compartment, 3 gal. of oil in each tank, 65 gal. gasoline.

At an altitude of 250 ft., over a measured course of one mile, the computed speeds for three-test runs were 103½, 103 and 104 miles per hour. With only a single engine going and the same load, the test speeds were 78 miles and 81 miles per hour.

Further tests are to be made shortly to determine whether the rebuilt plane will be added to the Air Mail Service equipment.



De Haviland Remodelled for Use of the Post Office Department

Order of Finish in the International Air Derby

Finish	Plane	Pilot	Engine	Hp.	Starting Point	Flying Time	Penalties or Cause of Withdrawal
1.	DH-4	Lieut. B. W. Maynard	Liberty	400	Mineola	465¼	
2.	DH-4	Lieut. H. H. George	Liberty	400	Toronto	520¾	
3.	DH-4	Lieut. D. B. Gish	Liberty	400	Mineola	524¼	Penalty 21 minutes: changed propeller because of storm.
4.	DH-4	Col. G. C. Brandt	Liberty	400	Mineola	545¼	
5.	DH-4	Lieut. M. J. Plumb	Liberty	400	Mineola	559¾	
6.	Le Pere	Lieut. P. H. Logan	Liberty	400	Mineola	562	
7.	DH-4	Lieut. Ben Adams	Liberty	400	Mineola	564	
8.	DH-4	Lieut. J. P. Roullot	Liberty	400	Mineola	570¼	
9.	VE-7	Major R. Schroeder	Hispano	180	Toronto	572	
10.	SE-5A	Col. H. E. Hartney	Hispano	180	Mineola	589¾	
11.	DH-4	Lieut. R. T. Midkiff	Liberty	400	Mineola	597½	
12.	DH-4	Lieut. Ross Kirkpatrick	Liberty	400	Mineola	602¼	
13.	DH-4	Lieut. C. F. Brown	Liberty	400	Mineola	607¾	Penalty 48 minutes: changed inner tube in tire.
14.	SE-5A	Lieut. Charles Colt	Hispano	180	Mineola	621½	
15.	DH-4	Lieut. F. T. Honsinger	Liberty	400	Mineola	635	
16.	Fokker	Capt. C. W. Cook	Mercedes	180	Toronto	759½	Penalty 90 minutes: straightened axle twice.
17.	JN-4H	Major A. B. Gilkeson	Hispano	150	Mineola	764¼	
18.	JN-4D	C. S. Jones	Curtiss OX	90	Toronto	833½	
19.	JN-4H	Lieut. W. R. Taylor	Hispano	150	Mineola	836½	
20.	JN-4H	Capt. H. B. Chandler	Hispano	150	Mineola	895¼	
21.	JN-4D	Capt. R. H. Depew	Curtiss OX	90	Mineola	898½	
22.	Can. JN-4	Capt. S. S. Moore	Curtiss OX	90	Toronto	912½	
23.	Can. Training	Lieut. L. W. Bertaud	Curtiss OX	90	Mineola	1285¼	
24.	JN-4H	Lieut. Wallace Young	Hispano	150	Toronto	1313½	Penalty 60 minutes: three forced landings between controls.
25.	Fokker	Col. W. C. Barker	Mercedes	180	Toronto	1434½	Down between controls during night.
26.	Can. JN-4	Lieut. C. A. Schiller	Curtiss OX	90	Toronto	1520¾	Down between controls during night.
27.	DH-4	Major J. W. Simons	Liberty	400	Toronto	1536¾	Down between cohtrols during night.
28.	Standard	O. S. Palmer	Curtiss OX	90	Toronto	3323	Down between controls during night.
The following are not recorded in the final summary of times;							
	DH-9	Serg. C. B. Coombs	Liberty	400	Toronto	....	Disqualified for not circling field at Buffalo.
	Oriole	Roland Rohlfs	Curtiss K-6	150	Toronto	....	Disqualified for not circling field at Buffalo.
	DH-4	Capt. A. E. Simonian	Liberty	400	Mineola	....	Disqualified for not circling field at Albany.
	Oriole	Bert Acosta	Curtiss K-6	150	Toronto	....	Disqualified for not circling field at Albany.
	Caproni	Lieut. P. Melville	Isotta (3)	450	Mineola	....	Out at Toronto: cracked cylinder.
	Le Pere	Col. H. E. Hartney	Liberty	400	Mineola	....	Out at Buffalo: propeller frayed by hailstorm.
	DH-4	Major J. W. Simons	Liberty	400	Mineola	....	Out at Toronto: struck horse in landing at Toronto. Restarted.
	JN-4H	Lieut. U. G. Jones	Hispano	150	Mineola	....	Out at Knoxboro, N. Y.: forced to land by storm.
	L-W-F	Capt. J. M. Foote	Liberty	400	Mineola	....	Lost course: landed at Binghamton because of storm.
	L-W-F	Major Elliott Springs	Hispano	300	Mineola	....	Out at Batavia: ignition shorting because of rain-storm.
	DH-4	Col. H. B. Claggett	Liberty	400	Mineola	....	Crashed at Albany: overshot field.
	SE-5	Capt. J. O. Donaldson	Hispano	180	Mineola	....	Out: broken crank-case and out of oil.
	SE-5	Capt. H. W. Smith	Hispano	180	Mineola	....	Out at Buffalo, landed in storm and broke chassis.
	Oriole	J. D. Hill	Curtiss K-6	150	Mineola	....	Crashed at Albany in landing.
	SE-5	Capt. F. W. Steinle	Hispano	180	Mineola	....	Out: chassis wiped off.
	SE-5	Capt. R. W. Brown	Curtiss K-6	150	Mineola	....	Out: lost course and crashed landing in storm.
	SE-5	Capt. F. B. Kinley	Curtiss K-6	150	Mineola	....	Crashed at Albany to save spectators' lives.
	JN-4D	Major J. L. Lyons	Curtiss OX	90	Mineola	....	Out at Poughkeepsie: engine trouble.
	Avro	Lawrence B. Sperry	Gnome	100	Mineola	....	Out: leaky fuel tank.
	DH-4	Capt. C. H. Reynolds	Liberty	400	Mineola	....	Out at Troy: lost way in storm and blown off course.
	S-V-A	Austen B. Crehore	Spa	210	Mineola	....	Crashed at Albany: mistook signals in landing.
	DH-4	Lieut. C. S. Osborne	Liberty	400	Mineola	....	Out: returned to starting point because of storm and crashed.
	DH-4	Lieut. H. T. Slater	Liberty	400	Toronto	....	Flew home to Selfridge Field, Mt. Clemens, Mich.
	DH-9	Col. L. L. Breteton	Liberty	400	Mineola	....	Out: returned to starting point because of engine trouble.

The California Aerial Forest Fire Patrols

Patrols from Air Service Fields Cover Large Part of National Forests of Coast State, Says Major Bartholf

The airplane forest fire patrols from Ross, Rockwell, Mather and March fields, California, while yet in their earliest infancy, now cover daily a large part of the national forests of California extending from San Francisco to the Mexican border. Major John C. P. Bartholf, commanding officer of March Field, California, is quoted in the *New York Tribune*. The establishment and operation of this work constitute one of the important changes from war-time training to peace-time problems.

Immediately preceding the actual participation in this new work by the Air Service a conference was held in Los Angeles between Coert Dubois, district forester, the commanding officer of March Field, Major John C. P. Bartholf, and the executive officer of Ross Field, Major R. S. Bamberger.

The problem presented was how the Air Service could render the greatest aid in guarding against the destruction of the underbrush and timber over some thousands of square miles of national forest which cover extremely ragged and inaccessible mountains. The difficulties were further emphasized by the summer drouth, which added materially to the fire hazards and which renders the protection of these areas all-important to the great tracts of valley under intensive cultivation. The Western cultivation is, of course, wholly dependent upon irrigation.

Inasmuch as prevention is nine-tenths of the battle, the early discovery of fires in such a country has been proved to be a real governing factor. Because the airplane excels as a means of observation, the problem was considered from this point of view.

Formerly the most effective means of information employed was the forest ranger lookout stations, whose view was restricted by the surrounding mountains. Very often it was possible, under the old system, to locate a fire only after it had reached sufficiently large proportions to allow the smoke to rise above the tops of the intervening ranges, hiding entirely the many abrupt canyons. Even when so discovered merely the approximate location could be given and a rough guess hazarded concerning its size and probable course of destruction.

In contrast to the limited field of vision of the lookout on whom it was formerly necessary to rely, we now find the airplane observer looking down upon the mountains and canyons as upon a map spread out beneath him. Even the smallest wisp of gray smoke becomes well defined against the greens and browns of the forest growth. The nature of the surrounding ground and the drift of the smoke, however slight, furnish to the firemen in the sky ready indications of the wind direction and velocity. The wireless telegraph at the pilot's elbow flashes the warning to the Forestry Bureau of Protection.

To acknowledge the airplane patrol the more ideal, one has but to note that clouds and rain—the dread of the fire—are the best natural enemies of forest fires. The hot, dry weather which allows the full effect of the sun's rays to be felt and in which the fires thrive offers an atmosphere which is so clear that insignificant objects, many miles distant, stand well defined as under a microscope.

The following is the plan of operation adopted: The observation balloon at Ross Field furnishes a fixed lookout station by operating continuously at an altitude of 2,000 or 3,000 feet covering the southern slope of the Angeles National Forest for a distance of some forty miles. In addition, a fire truck, carrying equipment suitable for combating brush fires, is maintained in readiness at all times, and in direct telephonic communication with the balloon. This equipment has already proved its value, not only in the purpose for which it was originally intended but also by being the first arrival at the scene of fires in neighboring ranches.

Airplanes from March Field operate one route, starting northward of Ross Field and covering the valleys which lie hidden behind the abrupt southern barrier of this range. From this point the patrol runs easterly over the Cajon Pass, Little Bear Lake and the scenic automobile drives on the crest of the San Bernardino Mountain range, to Big Bear Lake, situated at an altitude of 7,000 feet. Before returning the route passes southerly over the eastern end of this range to a point where a part of the Imperial Valley becomes visible.

Major John C. P. Bartholf

The second route embraces the northern end of the Cleveland National Forest, which contains several extensive irrigation reservoirs, and finally links up with the Rockwell Field patrol at San Diego.

The report of all fires is made by reference to Geological Survey maps divided by co-ordinates into one-mile squares. Pilots carry duplicate copies of maps used in the office of the forest supervisor in Los Angeles to whom all reports are made.

Although radio messages from the patrol planes to the receiving station at March Field effect the promptest report, it was decided to supplement this means of communication by dropping a message attached to a parachute over the nearest town. In order to insure the operation of this method the people of all the surrounding towns are notified by their respective Chambers of Commerce, through the medium of the local newspapers, the precise nature of the work undertaken by the aerial patrols and the proper procedure to be taken by any one finding a parachute message.

The first of June saw the actual start of operations at March Field with two patrols operating on each route and totalling a distance of more than 400 miles a day.

A fire was located almost at the outset, the report of which showed the extensive popular interest which had been aroused. Seven minutes after a parachute had been dropped the district forest ranger had received the location of the fire and eight minutes later the Los Angeles supervisor had been notified. In no case has a message sent by this means failed of delivery within a surprisingly short space of time.

The national forests placed under a semi-daily patrol from this field alone extend some 1,400 square miles. The area swept by Rockwell Field, San Diego, joins this district on the south and adds many more miles to the unbroken chain of forests which are covered by airplane observers, while at present the patrol from the southern field stops at this station for luncheon—and gas. In addition to the actual forests one finds much more territory of less importance where the prompt report of a fire may nevertheless prevent considerable damage. The natural barrier of the Mohave Desert on the north precludes any such direct contact with Mather Field.

Although June is considered productive of the fewest forest fires of any summer month, the pilots of this station have reported no less than thirteen within the boundaries of the national forests. Several more outside these areas have been reported to the deputy rangers of the affected district, and the numerous telephone calls regarding these local fires have further indicated the public appreciation of the new undertaking of the Air Service.

Perhaps the most interesting and significant feature of this patrol stands out clearly when the fires are spotted on a map. The majority lie in the canyons far back in the mountains, where the winding dry washes prevent discovery from the open valleys and the telltale smoke of a small fire is dissipated before it can rise above the mountain ranges.

Even Airplanes

Airplanes are now being used to locate illicit distilleries in the Alabama mountains by Deputy Marshal J. A. Wall, who himself made the first flight over the territory.

Youngster in Flight

The youngest passenger to fly in an airplane is believed to be Virginia Marie Waibel, four years old, who reached an altitude of 1,600 feet and remained in the air fourteen minutes in a machine which left the Queens Village Airdrome, Long Island, recently. The little tot was seated on the lap of her father. The machine was piloted by Gilbert Budwig, formerly instructor at Blockwell Field, California, and test pilot of the air mail service. Miss Waibel was disappointed that she "didn't get a loop."

Later Virginia, this time with her mother, went up with Dana C. DeHart, whose experienced piloting was rewarded by a kiss.

Danish Aviation

The Danish Government has taken steps to develop aerial navigation between Denmark and the neighboring countries. A considerable number of Bristol biplanes have been acquired and are now on their way to Denmark. Accompanying them are a number of skilled British airmen, who are to act as instructors of the Danish pilots to be employed on the projected services.

By reason of its peninsular formation, Denmark has always suffered many of the handicaps of isolation. The tedious sea journey to the other countries of Scandinavia or to Britain, or the inconvenient train route through Hamburg to the rest of Europe have militated against the speediest trade relations.

Local Legislation

The Fliers' Club of Spokane, Wash., an organization of former Army aviators, is appealing to the City Council for the passage of an ordinance governing aerial traffic over the city.

News of the Army and Navy Air Services

Fields to be Retained

Hazelhurst and Mitchel Fields at Mineola and the new air coast defense field on Staten Island are to be retained by the Government as flying fields, with full equipment and quotas of men. All other flying fields near New York are to be abandoned, according to plans of the General Staff.

The Government has purchased Mitchel Field and has leased eighteen acres for an addition to it. For Hazelhurst Field 672.6 acres have been leased. On Staten Island the Government purchased last June 672.6 acres for use of the new air coast defense field.

Dallas-Boston Fliers

Dallas-Boston fliers in 5 De Haviland airplanes flew from Rochester to Hempstead, N. Y., a distance of 285 miles in 110 minutes, recently. The maximum altitude reached was 4,000 feet.

Navy in Balloon Race

The Navy will be represented by three entries in the Missouri Aeronautical societies' duration free balloon race starting September 26. Acting Secretary Roosevelt has announced he had accepted the societies' invitation for naval crews to compete.

The race will start from St. Louis. Army and Navy as well as civilian crews will compete. The balloons will be of 40,000 cubic feet capacity and will be filled with refined coal gas.

Flying Under Bridges

Three airplanes in military formation flew under the five East River bridges, New York, going on to Hazelhurst Field after successfuly accomplishing the feat, Aug. 28. They took each of the bridges, from Hell Gate to the Brooklyn Bridge, on successive glides and never scraped a wing.

Lieut. A. M. Roberts, with Corp. E. R. Leggett as observer, were in the leading plane. Lieut. G. H. Burges, with Sergt. R. R. Van Etta and Lieut. N. L. Elliott, with W. T. Skinner, were in the other two. The planes came from the camp of the West Point cadets near Harriman, N. Y.

Brown to Lecture

Lieut. Arthur Whitten Brown, arriving in New York Sept. 20th, will make a lecture tour of the United States, speaking on his record-breaking flight with Capt. John Alcock in the journey from Newfoundland to Clifden, Ireland, in the Vickers Vimy-Rolls plane.

Will Tour World

Capt. Charles J. Glidden, donor of the Glidden trophies for automobile and airplane touring, and who has driven an automobile 100,000 miles twice around the world in thirty-nine countries, contemplates touring the world by airplane.

Capt. Glidden has announced that he intended to cover in one or two years all the points reached in his automobile tour of the world, which required eight years. On the automobile tour the extreme points were the Arctic Circle in Sweden and the most southerly road in the world in New Zealand.

Washington Aeronautics

Commercial flying at Sunnyside, Wash., is to be inaugurated by Lieut. R. P. Parshall. A practicable flying field is being prepared.

Discharges from Army

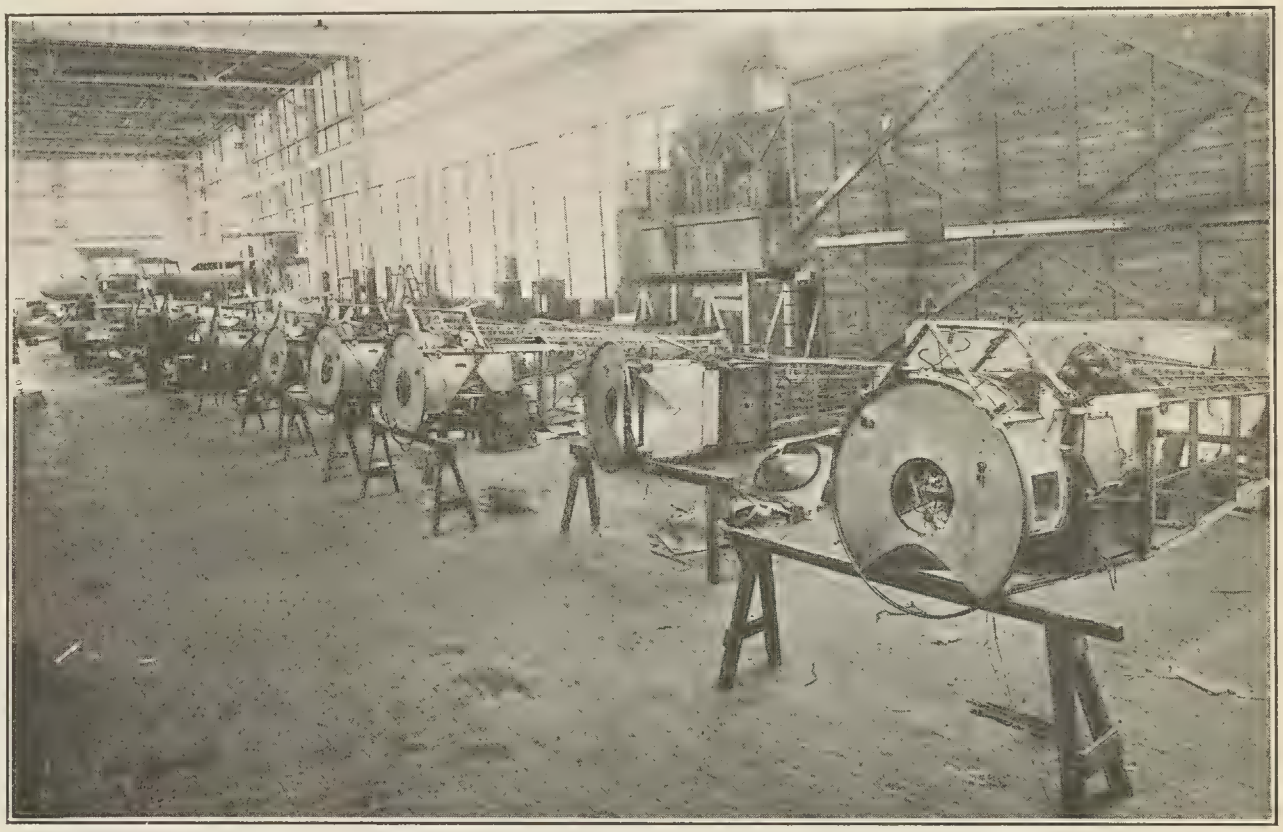
Instructions are being sent to each Department Commander, Commanding Officer, of each camp, post and station incontinental limits of the United States not under jurisdiction of Department Commander and not under immediate jurisdiction of the Chief of Staff Corps or Department:

1. Each organization commander will take action with a view to discharging, in accordance with current instructions, by September 30, 1919, all men enlisted or drafted for the emergency who are physically eligible for discharge and who are not in confinement awaiting trial or serving sentence by court martial. No man of this class will be retained in service after that date unless it has been definitely determined in each individual case that he cannot be spared or replaced by an available enlisted man of the Regular Army or, under existing authority, by a civilian, or unless he has requisition in writing to remain temporarily in service or is included in the Medical Corps personnel surplus for transfer to a general hospital, as provided in the Adjutant General's Office telegram of August 15.

2. Not later than October 10, 1919, report will be made to the Adjutant General, showing for the date of September 30, the number of enlisted men in each regiment and other separate units not constituting a part of a regiment, classified as follows: Men enlisted or drafted for the period of emergency; men who have been recalled to active service from the Regular Army Reserve; men who enlisted prior to April 2, 1917, and who by December 31, 1919, will have completed the period of active service prescribed to make them eligible for furlough to the Reserve; men who enlisted prior to April 2, 1917, and who will not have become eligible for furlough to the Reserve by December 31, 1919; men who enlisted subsequent to February 28, 1919, for one year and those for three years.

3. Where emergency men are retained after September 30, full explanation will be made as to the necessity for same and an estimate will be given as to the date when all such men can be dispensed with. There will be no relaxation of effort to discharge these men and report will be rendered when all have been discharged.

Bay of Naval Aircraft Factory Shop



The Naval Aircraft Factory is at Present Engaged in Improving, Modifying and Experimenting with Various Types of Land and Sea Planes in Possession of the Navy Department. The Small Planes in the Foreground are Hanriot-Dupont, Single-Seater Seaplanes, Driven by Clerget, Rotary Motors, Which are Being Fitted with Landing Gears, Permitting Them to be Launched from the Deck of a Battle Ship and with Emergency Flotation Gears to Enable Them to Alight Safely on the Water in Case of an Accident. The Gallaudet Seaplane in the Rear is Being Fitted with New Floats Which Will Be Tested After Installation. Other Work Being Carried on in this Department of the Naval Aircraft Factory Includes the Fitting of Landing Gears to Sopwith Seaplane, Converting It Into a Ship's Airplane, Fitting Hinged Wings to the HS Type Seaplane, Enabling It to be Stored in a Small Space and Assembly of Aeromarine and N-9 Planes to be Used in Training Naval Aviators.

British Decorations

Royal Air Force officers and other ranks now resident in the United States, or its overseas possessions, who have been awarded the Distinguished Flying Cross or the Air Force Cross, and who are not yet in possession of the same, should communicate, without delay, to Air Commander L. E. O. Charlton, British Air Attache at the British Embassy, Washington, D. C., in order that arrangements may be made for the due presentation of the decorations.

This also applies to officers late of the American Air Services who are similarly entitled but who are demobilized, therefore not necessarily in communication with the authorities in this matter.

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Formerly Air Service Journal

The International Air Derby

THE International Air Derby—as the New York Toronto and return race organized by the American Flying Club has been popularly named—was the greatest and most convincing public demonstration yet given of the all-round safety and reliability of heavier-than-air craft under conditions such as commercial air services will have to contend with.

Through the greater part of the race, weather conditions were extremely unfavorable, so much so that at times contestants were held at control stations for several hours. That in spite of these difficulties thirty-two out of fifty-three actual starters finished the race and only four airplanes were eliminated through crashes is a high testimonial to the intrinsic worth of American airplanes and airplane engines as well as to the professional skill and devotion of the American pilots in charge of them.

The Liberty engine in general and the DH-4, USD-9A, and Le Pere machines to which it was fitted, made an especially fine showing in the race, thus proving beyond doubt that this much discussed national product has now reached a point of perfection where it gives full satisfaction to its users. It is, by the way, noteworthy that out of nineteen DH-4's entered in the Derby fifteen finished the race in perfect condition, and five of these carried off the leading places in the speed contest. While mentioning the remarkable performances of these ships a special word of commendation should go to two recent American products of original design— the Le Pere and the Vought VE-7. Considering the fact that the Le Pere was the only ship of its type entered in the race and that it succeeded in making sixth place, strikingly demonstrated the excellence of this new airplane—the first to be actually designed round the Liberty-12. The performance of the Vought VE-7 was just as remarkable—if not more so—for while this ship too was the only representative of its type, it finished ninth despite its initial handicap of having less than half the horsepower of the Liberty-engined contestants which precede it on the list of winners. The 180 hp. Hispano-Suiza engine, which propelled the VE-7, gave a magnificent proof of its great reliability in connection with this high performance machine.

Among the low-powered airplanes the Curtis JN series and its derivative, the Canadian Training, have put up a showing which truly exceeded legitimate anticipations, considering that these ships were primarily designed for training and not for a 1000-mile cross-country race.

Altogether the International Air Derby gave a much needed stimulus to the aircraft industry, which has been in a state of near-stagnation since the demobilization of the Air Services, while on the other hand it has helped to awaken a large section of the public to the safety of air travel. The inadequacy of existing flying fields was also emphasized at certain control stations and it is to be hoped that this lesson will not be lost on progressive communities. It is quite obvious that if an airplane race can be run in bad weather with war machines having a comparatively high landing speed and with inadequate landing fields without causing a single fatality, it will presently be possible to attain with airplanes having a low landing speed and assisted by suitable aerodromes a degree of safety that will compare favorably with other means of locomotion.

This is apparently the most outstanding feature of this great aeronautical event which really marks the commencement of the new peace era in the annals of American aviation. The far-sighted attitude of General Menoher, Director of Air Service, in authorizing military pilots to participate in the race on Army machines and the general assistance extended to the American Flying Club in the organization of this event are warmly to be commended, for competitions of this sort not only stimulate aviators and constructors but also possess a high educational value.

On the other hand, the highest praise is due to the American Flying Club in general, and to Chance M. Vought, Chairman of its Contest Committee, in particular, for the thorough-going manner in which the Air Derby was organized and run for the best interests of American aviation.

The Navy's Airship Progress

THE progress made by the Naval Air Service in the direction of rigid dirigible construction, while necessarily slow indicates that in a few years it will be possible to introduce this new fighting and observation craft into our war plans. To those unfamiliar with the construction of this type of aircraft the delay may seem long, but when it is remembered that the building of the hangar in which these monsters of the heavens will be assembled will take a year and cost in the neighborhood of $2,500,000, it will be seen that the time necessary for this kind of aircraft development is certain to be prolonged.

If the United States could have secured several of the German airships which will be delivered as part of the peace settlement to the allies, some of the experimental work required in the preliminary stages would have been avoided. It may not yet be too late to secure a Zeppelin.

Glue and Veneer in Aircraft Construction

ONE of the minor and yet important advances in airplane construction during the war has been the scientific development of the use of glue and veneer. Prior to the war, glue manufacturers had secret formula; veneer manufacturers, secret methods of construction. No standard methods were known for the manufacture of plywood. No standardized tests were obtained. When the airplane designers wished to use veneer, they went to the best firm they knew, and they used materials more or less blindly.

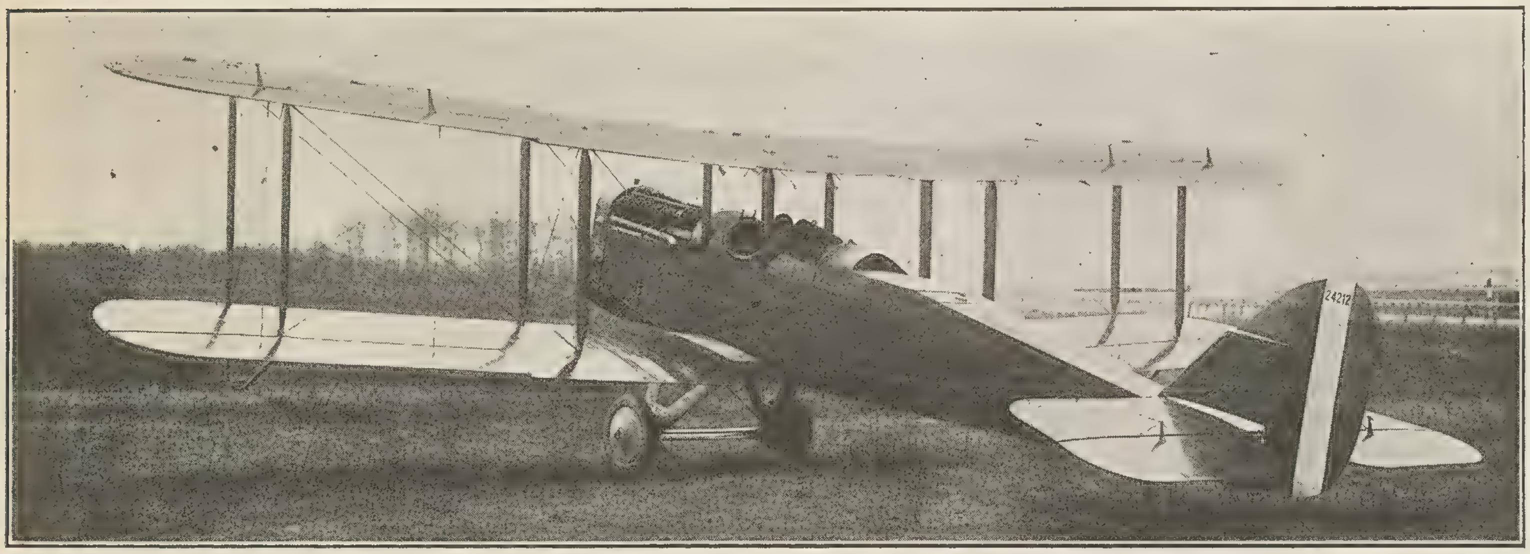
During the war, there were evolved in the various laboratories, such as the Forest Products Laboratory, the Bureau of Aircraft Production and the Bureau of Standards, well-defined methods of making panels, of testing them for strength and water-proof qualities.

At the present moment, sufficient data is available so that the designer can select the panel from a large number of standards, using any wood he pleases. Given a certain glue, he can know with absolute definiteness what the water-proof properties are and what the physical properties will be. Data is available on so many species of plywood that he can use a hard wood for large members where the structural rigidity is sufficient or he can select a soft wood for small members, where the hard wood would not give enough bulk.

There is, at the present moment, no excuse whatever for misuse of veneer.

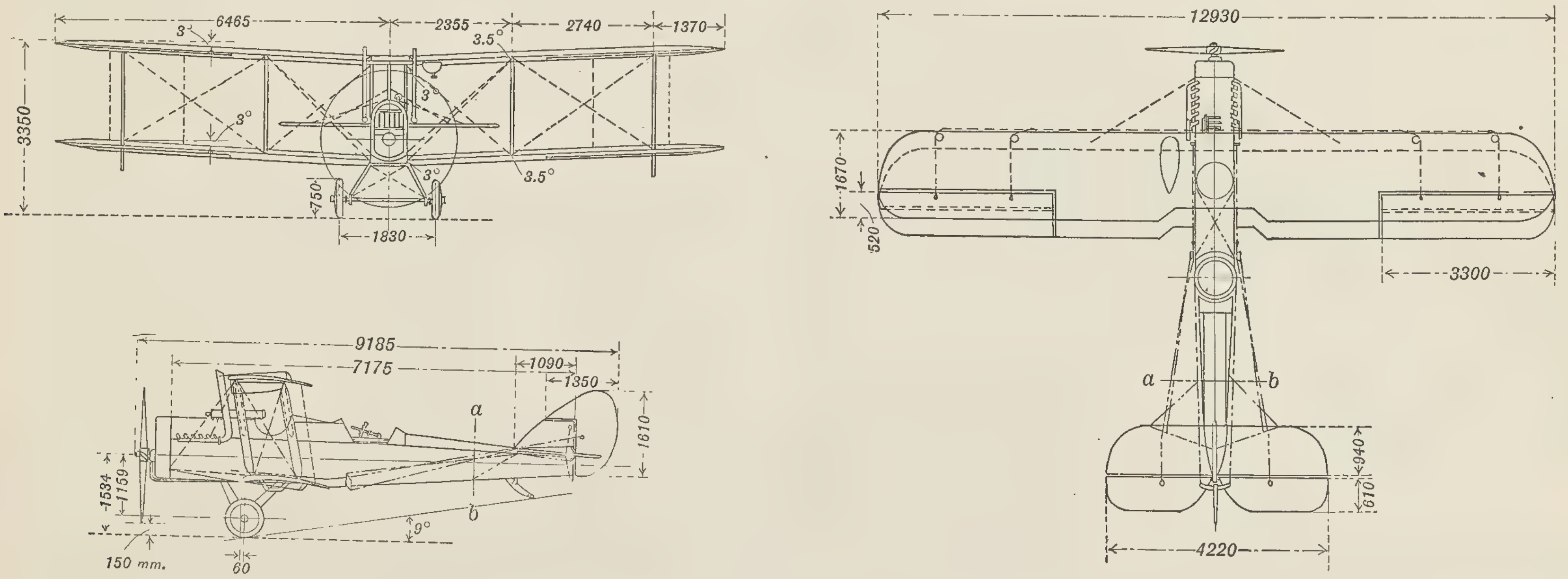
THE WORLD'S AIRPLANES AND SEAPLANES
De Haviland-4

Group 2—Fighters, Day-Bombers and Reconnaissance Machines—Number 1



De Haviland-4 With Mail Compartment

De Havilands were the eyes of the Army and their reports after a flight were the basis on which all troop maneuvers were carried out, while their bombing raids over enemy towns and camps greatly reduced the enemy's morale and therefore hastened the conclusion of hostilities. Their crews consisted of two men; a pilot and a gunner. It was the pilot's business to attend to the general running of the machine, to keep in formation and carry out cruising orders received in flight. He was equipped with machine guns, usually firing through the propeller. On the latest models four guns were mounted, synchronized with the propeller for the pilot's use. The gunner or observer was equipped with two guns on a Scarff ring mount. These guns were for protection against attack from the fast enemy scouts. It was the observer's business to drop the bombs at the proper place, to make records of the results of the bombs, to observe enemy troop movements and ammunition supplies, to make photographs of enemy territory, and to operate the wireless outfit, and to pilot the machine, if the pilot is injured.



Scale Drawings of De Haviland-4

These machines were equipped with high powered motors and were remarkable for their high speed and high carrying capacity and excellent performance under adverse conditions.

The De Haviland 4 with the Liberty has been one of the sucessful associations with America's air program. The adoption of the Liberty 12 has given the United States results, in both performance and production, that excell those attained by the British type; which is equipped with a 300 hp. Rolls-Royce engine. With slight modifications in its equipment the De Haviland 4 is used for reconnaissance, bomb dropping and fighting. The DH-4 machines were the first American built planes to be used at the front. They participated in many bombing expeditions over enemy territory, often encountering conditions that only the fittest could endure. The construction of this type permits a high climb and high speed in horizontal flight which affords considerable protection in case of attack. Complete night flying equipment is installed and many night bombing raids were successfully executed with the Army's De Havilands.

The night flying equipment consists of green and red port and starboard electric lights near the ends of the lower plane, a rear white light on the deck just aft of the gunner's ring and wing tip flare lights near the wing tip skids. Current for lighting and wireless is supplied by two generators attached to the inner sides of the front landing gear struts.

Racks on the under side of the lower plane are provided for twelve bombs which are released by means of a cable from the pilot's cockpit. The bomb sight is built into the body just behind the rudder bar. Dual control is installed and the observer, by means of a spring catch, can remove the control stick in the rear when not in use.

Two fixed Browning machine guns, synchronized with the propeller are mounted on the cowling in front of the pilot and two movable Lewis guns are carried on a rotatable Scarff surrounding the rear cockpit. The radiator is provided with shutters that can be operated from the pilot's cockpit.

POWER PLANT

400 hp., 12 cylinder Liberty.
Fuel capacity 67.6 gal.
Oil capacity 5.6 gal.
Fuel consumption .54 lb. per hp. per hr.
Oil consumption .03 lb. per hp. per hr.

MAIN DIMENSIONS

Span (upper plane), 42.3 ft.
Span (lower plane), 42.3 ft.
Chord (both planes), 5.47 ft.
Gap between planes, 6.0 ft.
Stagger, 12.6 ins.
Length overall, 29.7 ft.
Height overall, 10.85 ft.
Angle of incidence, 3 deg.
Dihedral angle, 174 deg.
Area of upper plane, 216 sq. ft.
Area of lower plane, 205 sq. ft.
Area of ailerons (4), 76 sq. ft.
Area of stabilizer, 33.7 sq. ft.
Area of elevator, 23.3 sq. ft.
Area of fin, 5.1 sq. ft.
Area of rudder, 12.5 sq. ft.

MAIN WEIGHTS

Weight of fuselage, complete with engine, landing gear, tail planes, etc., 1912 lbs.
Weight of wings with bracing, 528 lbs.
Fuel and oil, 524 lbs.
Military load, 848 lbs.
Total, machine loaded, 3740 lbs.
Estimated useful load, 1300 lbs.

PERFORMANCE

Altitude (ft.)	Speed (m.p.h.)	Time of climb (min.)
0	128	0
5,000	126	4.6
10,000	124	11.6
15,000	120	20.5
20,000	105	

Possibly the most interesting structural feature of the DH-4 is the fuselage construction. It is of rectangular section and is covered with veneer from the radiator to the rear of the gunner's cockpit, eliminating diagonal brace wires in this section. The rear of the fuselage is constructed in the usual girder fashion, covered with linen, the longerons being spliced.

Veneer is used underneath the tail plane for a covering.

By means of a cable wrapped around a drum and worm at the lower end of the tail post the trailing edge of the stabilizer can be raised or lowered from the pilot's cockpit permitting adjustments within in the limits of —2 degrees and plus 5 degrees.

Peace Treaty Convention Relating to Aeronautics

Annexes A, B, and C to " Convention Relating to Air Navigation "
in This Issue of Aircraft Journal—Subsequent Annexes to Follow

Annex A

THE MARKING OF AIRCRAFT

I

General

(*a*) The nationality mark shall be represented by capital letters in Roman characters, *e. g.*,

France........F.

The registration mark shall be represented by a group of four capital letters; each group shall contain at least one vowel, and for this purpose the letter Y shall be considered as a vowel. The complete group of five letters shall be used as a call sign of the particular aircraft in making or receiving signals by wireless telegraphy or other methods of communication, except when opening up communication by means of visual signals, when the usual methods will be employed. The nationality and registration marks are assigned in accordance with the table contained in section VIII of this Annex.

(*b*) On aircraft other than State and commercial, the registration mark shall be underlined with a black line.

(*c*) The entry in the register and the certificate ot registration shall contain a description of the aircraft and shall indicate the number or other identification mark given to it by the maker; the nationality and registration marks mentioned above; the usual station of the aircraft; the full name, nationality and residence of the owner and the date of registration.

(*d*) All aircraft shall carry affixed to the car or to the fuselage in a prominent position a metal plate, inscribed with the names and residence of the owner and the marks of nationality and registration.

CERTIFICATION OF REGISTRATION.

(*Provisional form.*)

Nationality ....
Nationality mark..
Registration marks..
Date of registration..
Type of aircraft.... Tourist ....
Commercial........................
State ....
Maker ....
Maker's Number..
Description ....
Owner's full name..
Owner's residence..
Owner's nationality..
Station of the aircraft..
Signature and seal of authority issuing this certificate. ....

II

Location of Marks

The nationality and registration marks shall be painted in black on a white ground in the following manner:

(*a*) *Flying Machines.*—The marks shall be painted once on the lower surface of the lower main planes and once on the upper surface of the top main planes, the top of the letters to be towards the leading edge. They shall also be painted along each side of the fuselage between the main planes and the tail planes. In cases where the machine is not provided with a fuselage the marks shall be painted on the nacelle.

(*b*) *Airships and Balloons.*—In the case of airships the marks shall be painted near the maximum cross section on both sides and on the upper surface equidistant from the letters on the sides.

In the case of balloons the marks shall be painted twice near the maximum horizontal circumference, as far as possible from one another.

In the case both of airships and balloons the side marks shall be visible both from the sides and ground.

III

Additional Location of Nationality Marks

(*a*) *Flying Machines and Airships.*—The nationality mark shall also be painted on the left and right sides of the lower surface of the lowest tail planes or elevators and also on the upper surface of the top tail planes or elevators, whichever is the larger. It shall also be painted on both sides of the rudder, or on the outer sides of the outer rudders if more than one rudder is fitted.

(*b*) *Balloons.*—The nationality mark shall be painted on the basket.

IV.

Measurements of Nationality and Registration Marks

(*a*) *Flying Machines.*—The height of the marks on the main planes and tail planes respectively shall be equal to four-fifths of the chord. and in the case of the rudder shall be as large as possible. The height of the marks on the fuselage or nacelle shall be four-fifths of the depth of the narrowest part of that portion of the fuselage or nacelle on which the marks are painted.

(*b*) *Airships and Balloons.*—In the case of airships, the nationality marks printed on the tail plane shall be equal in height to four-fifths of the chord of the tail plane and in the case of the rudder the marks shall be as large as possible. The height of the other marks shall be equal to at least one-twelfth of the circumference at the maximum transverse cross section of the airship.

In the case of balloons the height of the nationality mark shall be four-fifths of the height of the basket, and the height of the other marks shall be equal to at least one-twelfth of the circumference of the balloon.

(c) *General.*—In the case of all aircraft the letters of the nationality and registration marks need not exceed 2.5 metres in heights.

V

Measurement, Type of Letters, Etc.

(*a.*) The width of the letters shall be two-thirds of their height and the thickness shall be one-sixth of their height. The letters shall be painted in plain block type and shall be uniform in shape and size. A space equal to half the width of the letters shall be left between the letters.

(*b.*) In the case of underlined letters the thickness of the line shall be equal to the thickness of the letter and the space between the bottom of the letters and the line shall be equal to the thickness of the line.

VI

Spacing Between Nationality and Registration Marks.

Where the nationality and registration marks appear together, a hyphen of a length equal to the width of one of the letters shall be painted between the nationality mark and registration mark.

VII

Maintenance

The nationality and registration marks shall be displayed to the best possible advantage, taking into consideration the constructional features of the aircraft. The marks must be kept clean and visible.

VIII

Table of Marks

The nationality mark of the State named below applies to the aircraft of its Dominions, Colonies, Protectorates, dependencies or of countries of which it is the Mandatory State.

COUNTRY.	MARK.	REGISTRATION MARKS.
United States of America............	N	All combinations made in accordance with the provisions of Section I (*a*) of this Annex, using a group of 4 letters out of the 26 of the alphabet, each group containing at least one vowel, e. g.: A D C J, P U R N.
British Empire..................	G	
France	F	
Italy	I	
Japan	J	
Bolivia	C	All combinations made with B as first letter.
Cuba	C	All combinations made with C as first letter.
Portugal	C	All combinations made with P as first letter.
Roumania	C	All combinations made with R as first letter.
Uruguay	C	All combinations made with U as first letter.
Czecho-Slovakia	L	All combinations made with B as first letter.
Guatemala	L	All combinations made yith G as first letter.
Liberia	L	All combinations made with L as first letter.
Brazil	P	All combinations made with B as first letter.
Poland	P	All combinations made with P as first letter.
Belgium	O	All combinations made with B as first letter.
Peru	O	All combinations made with P as first letter.
China	X	All combinations made with C as first letter.
Honduras	X	All combinations made with H as first letter.
Serbia-Croatia-Slavonia	X	All combinatons made with S as first letter.
Haiti	H	All combinations made with H as first letter.
Siam	H	All combinatons made with S as first letter.
Ecuador	E	All combinations made with E as first letter.
Greece	S	All combinations made with G as first letter.
Panama	S	All combinations made with P as first letter.
Hedjaz	A	All combinatons made with H as first letter.
Nicaragua	A	All combinations made with N as first letter.

Annex B

Certificates of Airworthiness

The following main conditions govern the issue of certificates of airworthiness :—

I. The design of the aircraft in regard to safety shall conform to certain standard minimum requirements.

2. A satisfactory demonstration must be made in flying trials of the actual flying qualities of the type of aircraft examined, provided that machines subsequently manufactured which conform to the approved type need not be subject to such trials. The trials shall conform to certain standard minimum requirements.

3. The construction of every aircraft with regard to workmanship and materials must be approved. The control of the construction and of the tests shall be in accordance with certain standard minimum requirements.

4. The aircraft must be equipped with suitable instruments for safe navigation.

5. The standard minimum requirements of paragraphs 1 to 3 inclusive shall be fixed by the International Commission for Air Navigation. Until they have been so fixed each contracting State shall determine the regulations under which certificates of airworthiness shall be granted or remain valid.

Annex C

LOG BOOKS

Journey Log

This shall be kept for all aircraft and shall contain the following particulars :—

(*a.*) Category to which the aircraft belongs: its nationality and registration marks; the full name, nationality and residence of the owner; name of maker and the carrying capacity of the aircraft.

(*b.*) In addition for each journey—

(i.) The names, nationality and residence of each of the members of the crew.

(ii) The place, date, and hour of departure, the route followed, and all incidents *en route* including landings.

Aircraft Log

This is obligatory only in the case of aircraft carrying passengers or goods for hire, and shall contain the following particulars :—

(*a.*) Category to which the aircraft belongs; its nationality and registration marks; the full name, nationality and residence of the owner; name of maker and the carrying capacity of the aircraft.

(*b.*) Type and series number of engine; type of propeller showing number, pitch, diameter and maker's name.

(*c.*) Type of wireless apparatus fitted.

(*d.*) Table showing the necessary rigging data for the information of persons in charge of the aircraft and of its maintenance.

(*e.*) A fully detailed engineering record of the life of the aircraft, including all acceptance tests, overhauls, replacements, repairs and all work of a like nature.

Engine Log

This is obligatory only in the case of engines installed in aircraft carrying passengers or goods for hire, and in such cases a separate log book shall be kept for each egine and shall always accompany the engine. It shall contain the following particulars :

(*a.*) Type of engine, series number, maker's name, power, normal maximum revolutions of engine, date of production and first date put into service.

(*b.*) Registration mark and type of aircraft in which the engine has been installed.

(*c.*) A fully detailed engineering record of the life of the engine, including all acceptance tests, hours run, overhauls, replacements, repairs, and all work of a like nature.

Signal Log

This is obligatory only in the case of aircraft carrying passengers or goods for hire, and shall contain the following particulars :—

(*a.*) Category to which the aircraft belongs; its nationality and registration marks; the full name, nationality and residence of the owner.

(*b.*) Place, date, and time of the transmission or reception of any signal.

(*c.*) Name or other indication of the person or station to whom a signal is sent or from whom a signal is received.

Instructions For Use of Log Books

(*a.*) The constructor shall fill in and sign the original entries in the log books, as far as he is in a position to do so. Subsequent entries shall be made and signed by the pilot or other competent person.

(*b.*) A copy of the certificate of airworthiness shall be kept in the pocket of the aircraft log book.

(*c.*) All entries to be in ink, except in the case of journey and signal log books; the entries for these may be made in pencil in a rough note book, but shall be entered in ink in the log book every 24 hours. In the event of any official investigation the rough note book may be called for.

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Machines furnished complete with 170 hp. Hispano-Suiza engine and instruments, or without engine.

With inexpensive factory alterations, machine will accommodate pilot and two passengers. Seating arrangement of passengers optional.

Can also be furnished as a hydro-aeroplane if desired.

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ARMY AND NAVY

—and—

PRIVATE INDIVIDUALS

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Member Manufacturers' Aircraft Association

Army Balloon School's Carnival at Fort Omaha

Cooperation of Officers at Post and Prominent Business Men of City Brings Deserved Success to Featured Meet

The Aerial Carnival held at the Army Balloon School, Fort Omaha, Neb., in July, for the combined purpose of acquainting the middle West with the work of the school and of arousing interest in that branch of the service, enjoyed a tremendous success.

The hearty cooperation accorded the carnival by the officers and men of the post command and the business men of the city of Omaha assured its financial stability.

Lieut.-Col. J. W. S. Wuest, commanding officer of the post, presided at the ceremonies preceding the program of events, which included maneuvering American observation-balloon, exhibits of Allied and captured German balloons, balloon jumping contest, and a balloon race for distance. An added feature was the appearance of two planes from the hangars of the Omaha Flying Company, which took motion pictures of the events from the air, which were later displayed at local theaters.

American, French and Captured German Balloons at Carnival

Announcing from the Air

The principal event of the carnival was the balloon race, of which a summary follows:

Balloon 2, "All America," Lieut. Richard E. Thompson, Pilot, Lieut. James B. Jordan, aide, left at 8:52 p. m., July 13. Landed 9 miles southeast of Portage, Wisconsin, 1:45 p. m., July 14. Maximum altitude 12,500 ft. Time in air 16 hrs., 53 min. Distance traveled 409 miles. First Place.

Balloon 1, "United States," Capt. Ashley C. McKinley, Pilot, Lieut. James T. Neely, aide, left at 8:58 p. m., July 13. Landed 6 miles south by west of Rowley, Iowa, at 12:01 p. m., July 14. Maximum altitude 9,000 ft. Time in air 16 hrs. 3 min. Distance traveled 236 miles. Second Place.

Balloon 3, "Victory," Lieut. William E. Huffman, Pilot, Lieut. William E. Connolly, aide, left at 8:55 p. m., July 13. Landed at 1:20 p. m., July 14. Maximum altitude 7200 ft. Time in air 16 hrs. 25 min. Distance traveled 211 miles. Third Place.

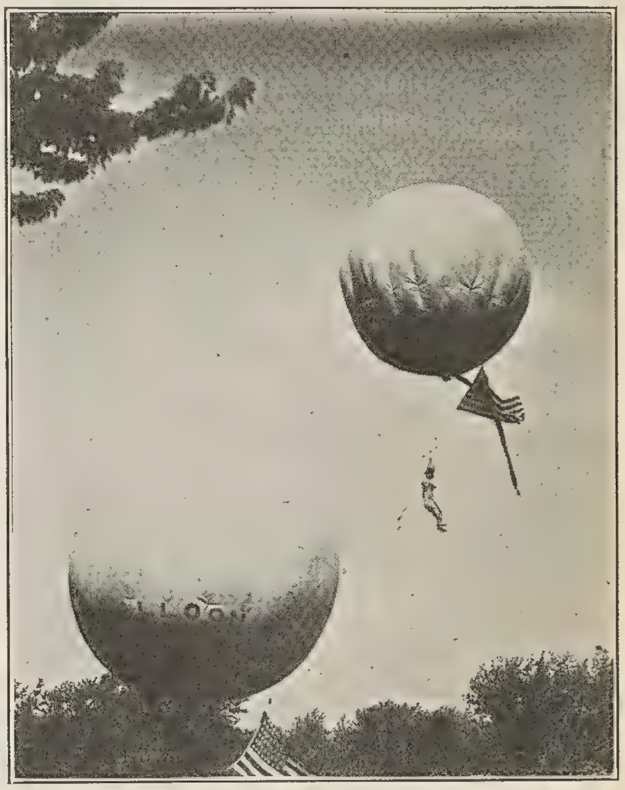
Balloon 4, "Cannon Ball," A. Lee Stevens, Pilot, Lieut.-Col. Wuest and Major Martin J. O'Brien, aides, left at 9:03 p. m., July 13. Landed four miles south of Ringstead, Iowa, 3:48 a. m., July 14. Maximum altitude 6600 ft. Time in air 6 hrs. 45 min. Distance traveled, 158 miles. This balloon contained the judges for the race. Balloon 4, "Cannon Ball," entered terrific thunderstorm at 2:10 a. m. Encountered cyclonic winds over Minnesota Lakes and forced southeast and finally beaten to the ground at 3:48 a. m. Other balloons encountered same storms but were apparently at their outer edge so continued the race.

Balloon 2, "All America," won a silver loving cup and the pilot and aide were awarded gold wrist watches donated by the Omaha Chamber of Commerce and the Board of Governors of the Ak-Sar-Ben Club of Omaha.

Balloon 1, "United States," and Balloon 3, "Victory," won second and third prizes, respectively, consisting of silver cigarette cases appropriately engraved for the pilots and aides.

The prizes were presented in person by Col. C. DeForrest Chandler, Chief of the Balloon and Airship Branch, Air Service.

The carnival was given considerable publicity in the Middle Western newspapers, who were eager to spread the news of its success. That this was well deserved was attested to by the great number of spectators present.



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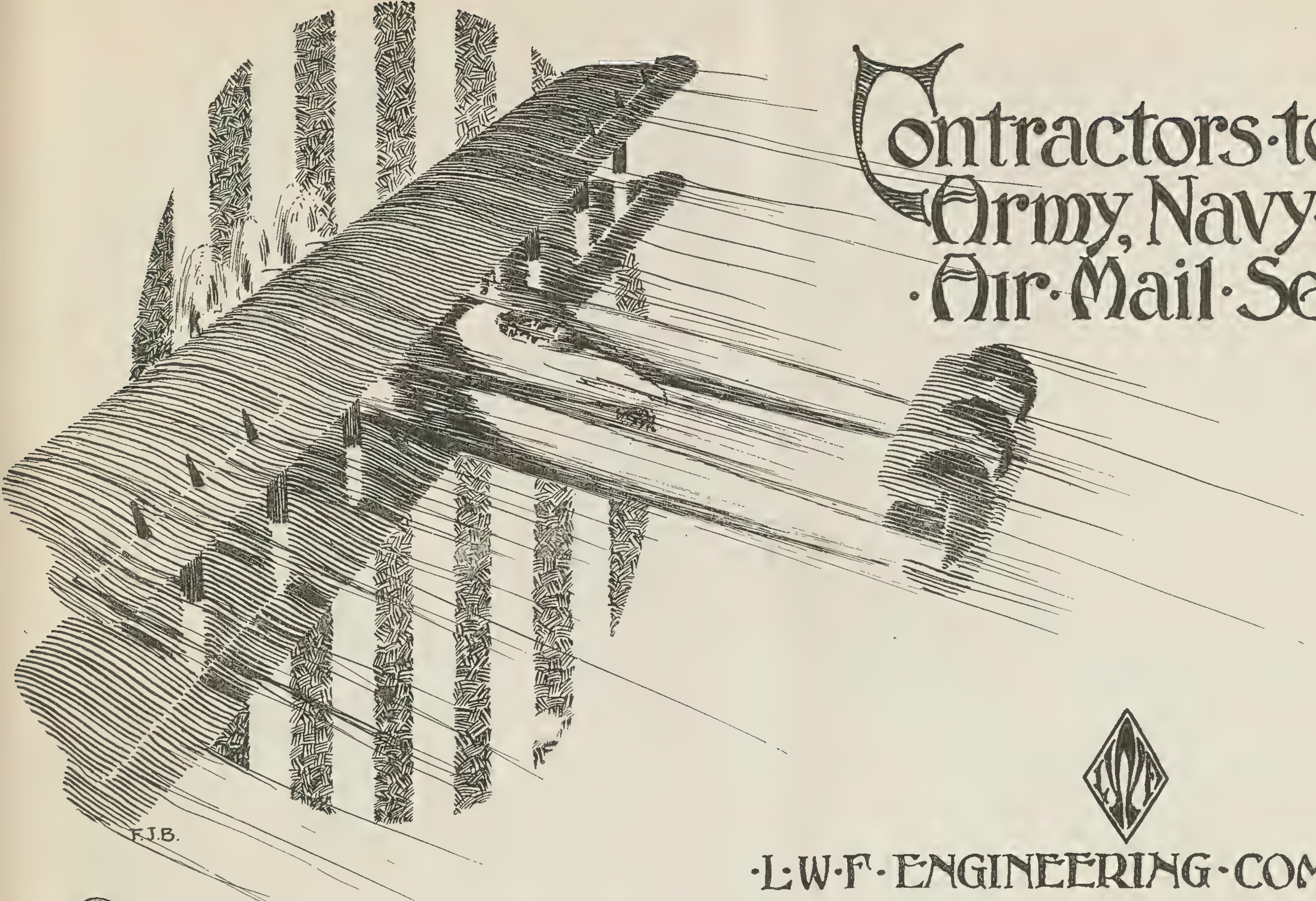

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MERCHANTS FIRE ASSURANCE CORPORATION OF NEW YORK

AVIATION DEPARTMENT

Is now issuing policies covering the following hazards to aircraft:

1. Fire and Transportation
2. Collision (damage sustained by the plane itself)
3. Property Damage (damage to property of others)

Additional coverage may be had against loss by windstorm, cyclone or tornado.

AUSTEN B. CREHORE, Manager, Aviation Department.
For two years pilot in Lafayette Flying Corps
and previously with this company since 1910.

We should be glad to discuss with those interested the various phases of insurance on Aircraft.

MERCHANTS FIRE ASSURANCE CORPORATION OF NEW YORK

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Fire—Automobile—Tornado—Explosion—Riot and Civil Commotion

Bids for Government

The Engineering Division of the Air Service has issued a call for sealed proposals for furnishing the Government certain types of experimental airplanes, to be designed and constructed by successful bidders. Specifications and complete information are on file in the office of the Engineering Assistant to the Chief of the Engineering Division, Air Service, to whom inquiries for detailed information must be addressed. The bids are open until October 15.

The proposal is intended to cover the 1919-1920 program of experimental airplanes to be constructed for and under the direction of the Engineering Division of the Air Service. Bidders are advised to closely examine the general specifications and the form of contract which will be required by the Government. The general regulations covering the bids may be received from AIRCRAFT JOURNAL.

A New Excuse

"The summons was handed me while I was in an airplane and blew away as I went up, before I ascertained the date," said Major C. Cooper, R. A. F., apologizing to the magistrate for failing to attend a London Court.

Base at Queenstown

A proposition to establish a base at Queenstown, where passengers traveling by airship from the United States may alight, has been received by the Urban District Council at Queenstown, Ireland, and help is promised for the project. The plans contemplate a station to accommodate an airship carrying 150 persons besides the crew.

It is also intended to establish a service of smaller airships carrying fifty persons for the distribution of passengers to Dublin, Liverpool, Manchester, York, Hull, Norway and Denmark.

Bristol Opens Office

William G. Ranels has recently opened an office at 512 Fifth Avenue, New York City, as representative in the United States of the British & Colonial Aeroplane Co., Ltd., of Bristol, England.

WILLIAM G. RANELS
Photo Brunel

Mr. Ranels was sent abroad by the War Department early in June, 1917, in connection with aviation matters and during two years was located in London as an aviation technical representative of the U. S. Air Service.

The British & Colonial Aeroplane Co., Ltd., was established February, 1910, and remarkable progress has been made since the foundation of the company. The company's sole object during this time has been to produce the most reliable types of machines and to organize methods by which every improvement and research development could be immediately embodied. Within twelve months of the formation of the company "Bristol" planes were flying in England, India, Australia, South Africa, Italy, Russia, Roumania and Spain.

At the beginning of the war, it is claimed, approximately 80 per cent of the British service pilots had been trained at the "Bristol" schools, and several types of "Bristol" machines were utilized by the British government. During the period of the war many new machines were developed, practically all of which were adopted by the British government and put into production for service.

Now that hostilities have ceased, plans have been prepared for the rapid development of types of machines suitable for commercial and sporting purposes. The work of developing planes suitable for military purposes will also be continued.

Capt. F. S. Barnwell, chief designer, who has been with the company for a number of years will continue to act in that capacity.

Fighting With Poles

An American aviation squadron is being formed in Paris on the lines of the Lafayette Escadrille to fight with the Poles against the Bolsheviki. Major M. C. Fauntleroy of Chicago and Capt. M. C. Cooper of Jacksonville, Fla., have received authority from General Rosvedowski, head of the Polish Military Mission, to form a squadron of aviators who, like themselves, have seen service in war aviation.

This American squadron is expected to go to Poland Sept. 15.

The ACE consumed less than 6 gallons of gasoline in a 100 minute cross country flight in Alabama on August 13, 1919.

Bruce Eytinge
R. A. F. Pilot

ACE High in Safety Factors

Price $2500

Low in Cost and Upkeep

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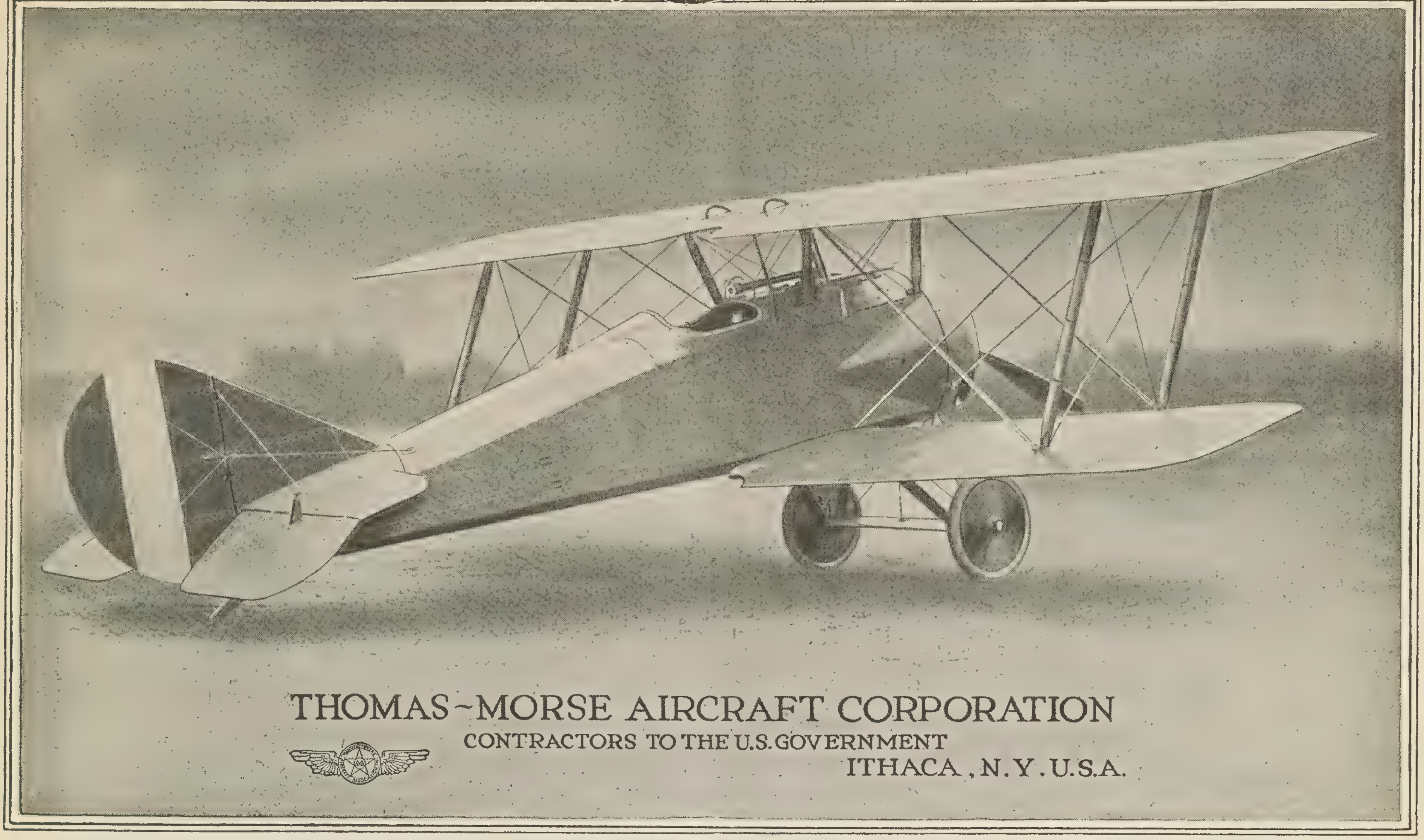

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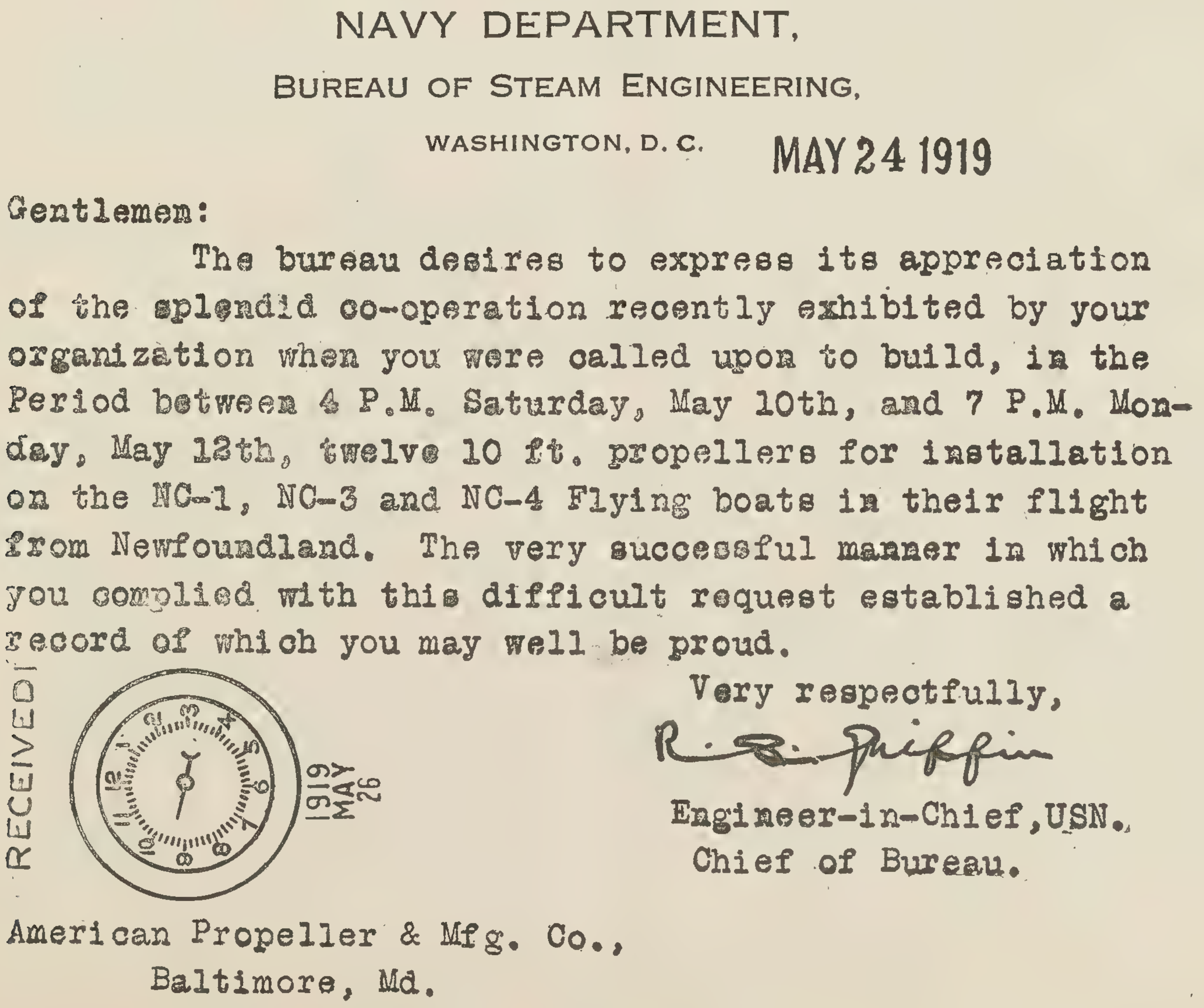

NAVY DEPARTMENT,

BUREAU OF STEAM ENGINEERING,

WASHINGTON, D. C. MAY 24 1919

Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

Very respectfully,

R. S. Griffin

Engineer-in-Chief, USN.

Chief of Bureau.

RECEIVED 1919 MAY 26

American Propeller & Mfg. Co.,

Baltimore, Md.

Lawson Plane's Flight

The Lawson passenger airplane, built to accommodate 26, recently made the 100 miles from Milwaukee to Chicago in 58 minutes. This flight is preliminary to a trip to New York, to be followed, according to present plans, by a flight across the continent. Pilot Charles Cox and three mechanics accompanied Alfred W. Lawson, president of the Lawson Airline Transportation Co., which constructed the ship, on the flight. No passengers were carried.

Previously the plane had made a test flight at Milwaukee, following ceremonies which included an address by city officials and the christening of the huge ship with champagne. Half of the fusilage of the machine is utilized as a cabin for the seating of passengers, and so commodious is this cabin that people can walk up and down the center aisle without stooping. The ship is powered by two 12-cylinder Liberty motors, aggregating 800 hp., and it will fly at the rate of between 90 and 100 miles per hour. In case one engine gets out of running order, the other engine will have sufficient power to continue the trip at slower speed for a distance of 200 miles. The wing spread of this ship is 95 ft., the length of the body is 50 ft., and the height of the machine over all is 15 ft. Two bladed 10 ft. 6 in. propellers are used in tractor formation.

With a full load of passengers and a large cargo of mail or other material, this machine is designed to climb 4000 feet in 10 minutes. It has a ceiling of 15,000 ft.

Trapping Smugglers

Policemen using airplanes have frustrated an attempt to smuggle more than $4,000,000 from Berlin to Switzerland, according to German newspapers. The police overtook an express train on which the smugglers were fleeing and arrested the men at Nuremberg.

Foreign Shipment

The first foreign shipment of airplanes since the war was made recently when the Curtiss Aeroplane & Motor Corporation sent six land machines of the JN type and two Curtiss Seagulls, the new three-passenger flying boat, to Rio de Janiero and Buenos Ayres. C. W. Webster, in charge of South American sales, will leave New York on August 23rd, heading a "mission" which the Curtiss Company is sending to South America to demonstrate American aerial craft to governments, corporations and individuals. He will take with him two Curtiss Orioles, the latest commercial three-passenger land machine. Lawrence Leon and Orton W. Hoover, two of the most experienced fliers in the United States, will pilot the machines, and James Honor and Roy Schneider are going as mechanicians.

Chaplin Starts Line

Syd Chaplin, motion picture actor, who has taken up aviation, has inaugurated a passenger air line with a daily schedule. Operating between San Pedro, California, and Santa Catalina Island, the Syd Chaplin Aircraft Corp. is now running a fleet of Curtiss Seagull flying boats on a six-times-a-day schedule, carrying passengers, mail and express. The distance covered is about 40 miles and the fare is $27.00 for one way and for the round trip, $43.20.

Rome-Naples Service

Passenger airplane service has been inaugurated between Rome and Naples, according to a Havas Agency report.

SALE OF NAVY FLYING BOATS, SEAPLANES, AERONAUTICAL ENGINES, SPARES

There will be offered for sale by sealed proposals to be opened at Bureau of Supplies and Accounts, Navy Department, Washington, D. C., at 2 P. M., September 22, 1919, a large assortment of Surplus, Heavier-than-Air Equipment. Most of this equipment is new and in excellent condition; many planes have never been uncrated.

The sale will include the following:

83 Flying Boats, HS-2-L, with 330 hp. Liberty Engine.
52 Flying Boats, H-16, with 2 330 hp. Liberty Engines.
20 Flying Boats, F-5-L, with 2 330 hp. Liberty Engines.
50 Seaplanes, Aeromarine Model 39-B with Curtiss 100 hp. Engine.
10 Flying Boats, Aero Model 40, with Engines.
2 Curtiss (GS-4) Gnome Speed Scouts.
1 Boeing Seaplane with Engine.
1 Seaplane, Aeromarine, Type 39A, without Engine.
250 Curtiss OXX-6 Engines, 100 hp. each, New.
50 Curtiss OXX-6 Engines, 100 hp. each, Used.
13 Curtiss OX-2 Engines, 90 hp. each, Used.
3 Curtiss OX-5 Engines, 90 hp. each, Used.
13 Curtiss OXX-3 Engines, 100 hp. each, Used.
51 Hispano Suiza Engines, 220 hp. each, Foreign Built.
20 Hall Scott Engines, Used.
32 Gnome Engines, 100 hp. each, New and Used.
9 Salmson Hydro-Glycier Engines, 220 hp. each, Used.
Sets of Spare Parts.
Handling Trucks.

The above materials are stored at the Fleet Supply Base, South Brooklyn, N. Y., Naval Aircraft Factory, Philadelphia, Pa., Naval Aircraft Storehouse, Gloucester, N. J., and Naval Air Station, Hampton Roads, Va.

Inspection is invited and may be arranged for with the Supply Officers of the above Naval Stations. Schedules of sale giving full description and complete data together with form for proposal is obtainable from above officers or at Salvage Section, Bureau of Supplies and Accounts, Navy Department, Washington, D. C., JOSEPHUS DANIELS, Secretary of the Navy.

8-29-19.

COLUMBUS, DE SOTO, DANIEL BOONE, PEARY, ROOSEVELT

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RISKS

Cannot be eliminated from adventures—but they can be

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Every British Manufacturer Who Entered an Aeroplane in
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Low Parachutes Drop

Jumping head first from a Curtis' seaplane flying at a height of little more than 250 feet, Major Orde Lees, of the Royal Air Force, established what is believed to be a record for a low elevation parachute drop from a speeding plane, Aug. 28. Lieut. D. H. McCullough, who navigated the NC-3 on its trans-Atlantic flight, piloted the seaplane.

Major Lees' drop is shown on the cover of this week's Aircraft Journal.

Shortly after noon the seaplane, flying from Port Washington, passed over upper New York bay. It hovered over Bedloe's Island and then flew around the Statue of Liberty. A small parachute was dropped. The major was sending down a pair of dry shoes. Then another floated down carrying his cap. Speeding up a bit the pilot guided the machine east. The signals had been given. The major was getting set.

As the plane turned back and headed for another spin about the statue Major Lees was seen to climb from his seat. Balancing himself for an instant he jumped. Head first he went spinning for the water below. A second passed. The parachute was not quite open. In another instant the white silk caught the wind and the "Guardian Angel Parachute" was living up to its name.

The drop was so low that Major Lees had not time to right himself. He struck the water head first. Lieutenant McCullough glided down to stand by if the major needed any aid. But the motor boat *Natalie Mae* with friends on board were first on hand to help him.

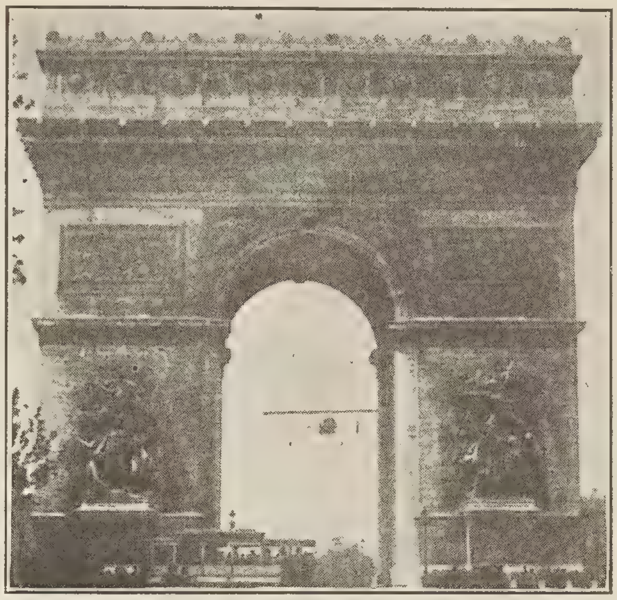
"When I go head first," explained the major, as he was wringing his clothes, "I never feel the dropping sensation such as is experienced when an elevator jumps on its descent. I guess it would kill me if I went feet first.

"The first part of the drop is terrifying. Being hurled through the air like a stone feels like suicide. But I just close my eyes, and don't mind it."

This was Major Lees' twenty-second drop from an airplane. His lowest jump was off the London Bridge, at a height of 153 feet.

Flies Under Arch

Sergt. Charles Godefroy, a French military pilot, has achieved the feat of flying under the Arc de Triomphe, conceded to be one of the most daring yet performed.



Flying Through the Arch
(C) *Keystone View Co.*

With less than ten feet margin on each side between the wings of the machine and the walls of the arc, the baby Nieuport swooped down to a height just about fifty feet above the ground and flew gracefully under the famous monument at a speed of more than one hundred miles an hour. Sergeant Godefroy, who is thirty years old and a native of Miramas (Bouches-du-Rhone), left a suburban aerodrome at seven a. m. and flew direct to the Place de l'Etoile. After circling over the heads of a few who had gathered in advance, Sergeant Godefroy wheeled around and flew straight at the arc. He had five or six hundred feet to go, and within that time—a bare ten seconds' flight—he had to calculate his aim with almost geometric precision. An error of a fraction of an inch might easily have sent him crashing against the walls of the arc. The spectators held their breath, but in an instant he had gone through and in less than a minute had ascended skyward and was bound for the aerodrome. The round trip had taken just twenty-five minutes.

The idea of flying under the Arc de Triomphe first occurred to Guynemer, the famous French ace, in 1916; but, after a low flight along the Champs Elysees, he realized the dangerous nature of the attempt and abandoned it.

Flight by the "Ace"

The "Ace" sport plane made an excellent flight in Alabama, Aug. 12, as a test of the machines delivered to one of the Aircraft Engineering Corporation's distributing agents in that territory. The test was made by Bruce Eytinge, chief test pilot of the company.

The trip of 100 miles from Montgomery to Birmingham was made in 80 minutes. The first leg of the flight was about 20 miles from Taylor Field to Montgomery, the landing being made at Wright Field which is about four minutes out of Montgomery. The balance of the flight to Birmingham was made late the next afternoon and ended after dark. The gasoline consumption for both legs of the trip was less than 6 gallons, it is claimed.

Proceedings Dropped

Emil J. Simon, manufacturer of radio equipment, against whom suit was brought by the Marconi Company of Canada for infringement of Canadian patents, has been released in the Exchequer Court of Canada from all claims and demands made by the plaintiff.

During the war, Mr. Simon furnished a considerable quantity of radio equipment to the French navy.

Proposals for Airplane Design and Construction.—Office of Contracting Officer, Eng. Div., A. S., McCook Field, Dayton, O.—Sealed proposals will be received here until 10 A.M., Oct. 15, 1919, and then opened, for furnishing certain types of experimental airplanes, designed and constructed by successful bidders. Further information on application.

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Upward of 5,000 gallons of Jeffery's Patent Waterproof Liquid Glue has been used by the U. S. Navy and War Departments during the past year, and as much more by the various manufacturers of seaplanes having government contracts.
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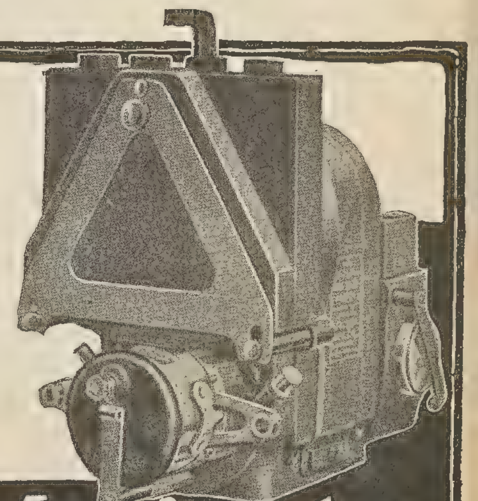
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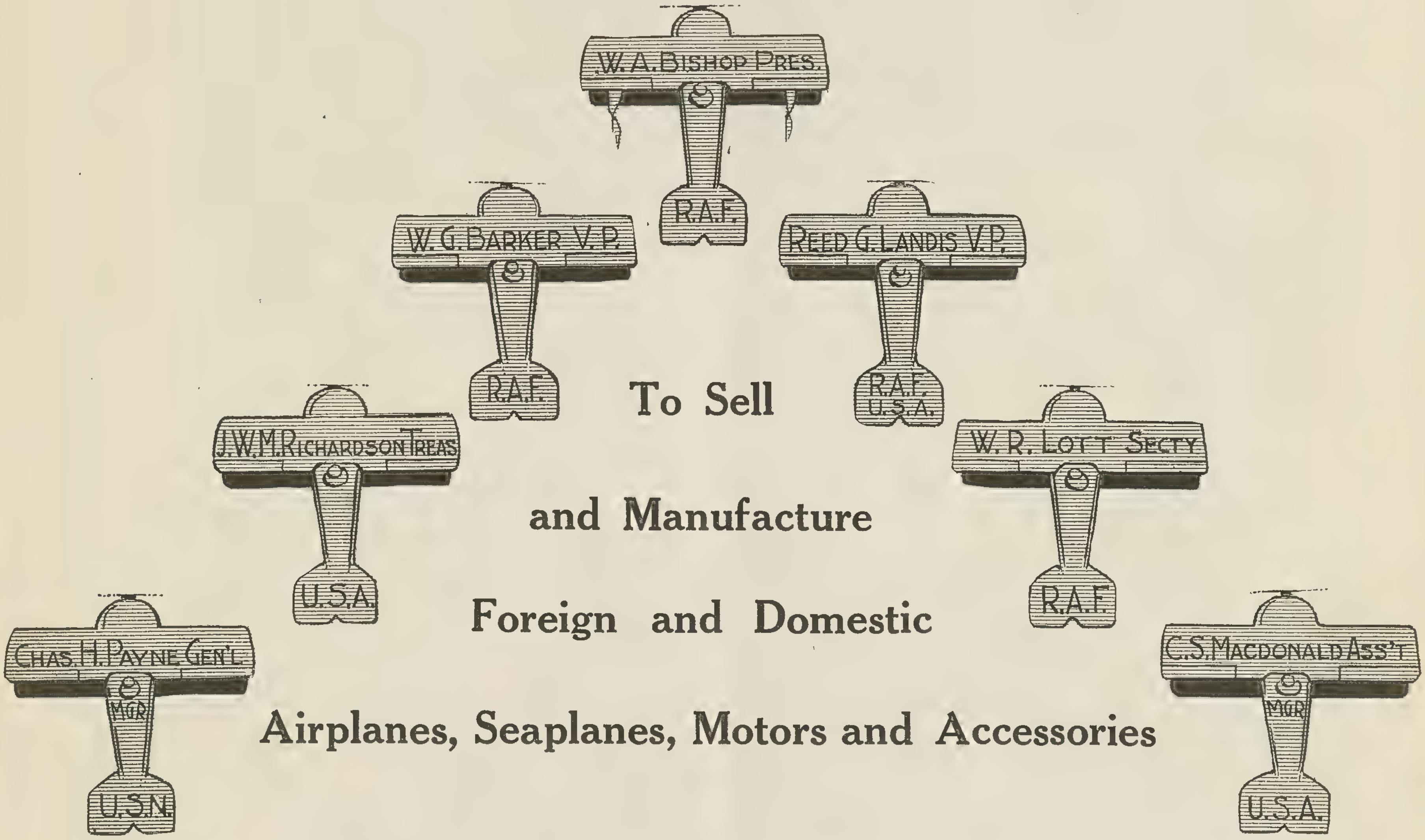
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INTERALLIED AIRCRAFT CORPORATION
185 MADISON AVENUE, NEW YORK CITY

Surgery by Aeroplane

IT was once the exceptional surgeon who made his rounds by automobile. What about visiting patients by aeroplane?

Not a bad idea, according to Dr. F. A. Brewster, of Beaver City, Nebraska. Called to Herndon, Kansas, to perform an operation, Dr. Brewster covered fifty-five miles in fifty minutes, reached his patient, operated, and returned in another hour to his home. He had Curtiss service. His is one of a number of experiences showing how the air road is the road to patient when *time-saving* is *necessity*.

There is a splendid opportunity for dealers to become identified with this profitable industry. Get in on the ground floor by writing for our sales plan for your territory.

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V #11

AIRCRAFT JOURNAL

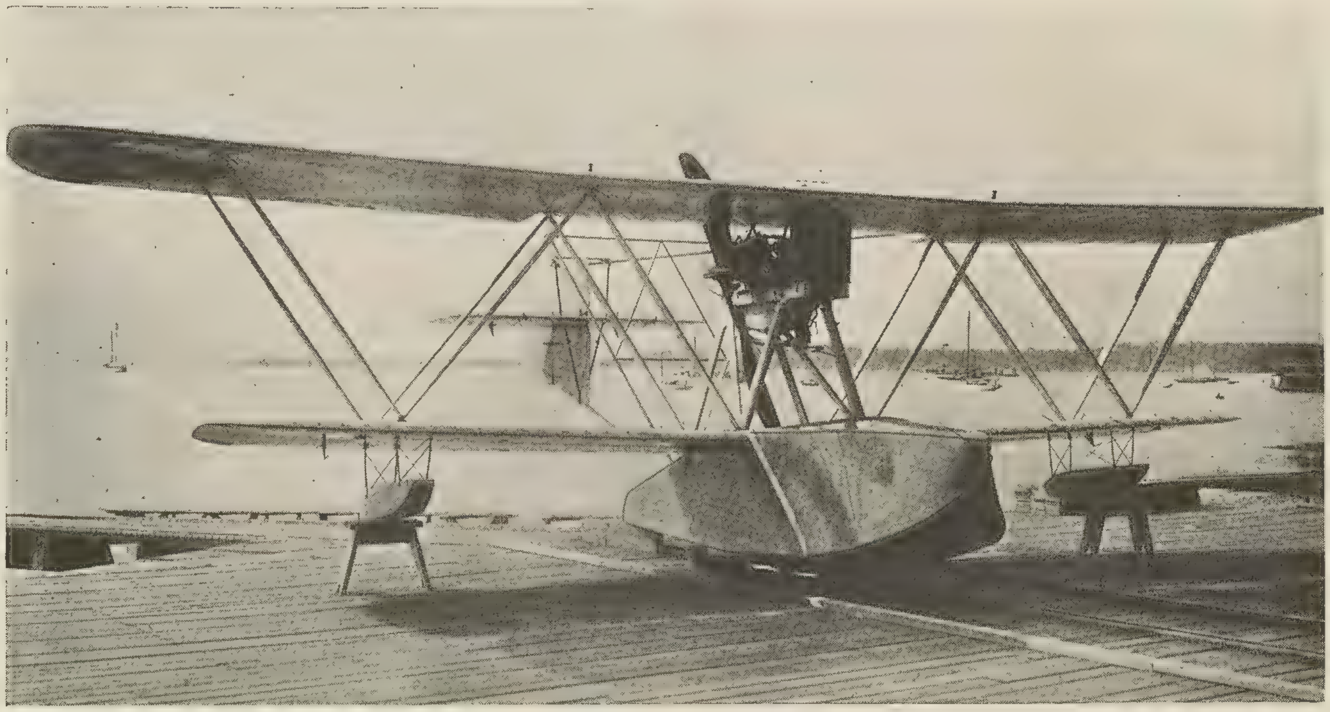
September 13, 1919 *Every Saturday* *Price Ten Cents*

Western Newspaper Union.

Flying Into Yellowstone National Park

Aéroplanes VOUGHT

Announcing the VOUGHT VE-10 3-place Flying-Boat



¶ A Flying-Boat of VOUGHT Design, Performance and Quality.

¶ Procurable at a Reasonable Price and of Assured Low Operating Cost.

¶ Performances and Factor of Safety Guaranteed.

CHANCE M. VOUGHT

Webster and 7th Avenues Long Island City, N. Y.

Pershing Returns to America

Aero Squadrons With First Division Have Won Enviable Reputation Abroad

General John J. Pershing and the First Division received the roars of welcome of the United States on their triumphal appearances on American soil during the past week. The General, returning to this country for the first time in more than two years, was greeted by cheering thousands who sought not only to express their appreciation of the services he had rendered, but as well to voice in one great chorus their realization of the significance of his return to his native land.

The jubilation at General Pershing's return was commenced far out at sea, finding tone in the droning of airplanes and seaplanes that were not tardy in finding his ship, the *Leviathan,* and escorting her to her pier. Representatives of the nation awaited him there.

During the week General Pershing marched in New York City at the head of the First Division—"First Over and Last Back." The division marched with full equipment, its marching column more than five miles in length.

The story of the Air Service aero squadrons with the First Division, as made public by the War Department, is one of absorbing interest.

During January, February and March, 1918, the Toul sector, occupied by American troops and air units for the purpose of training, due to its "stabilized" condition, was utilized for preliminary battle training of the earliest squadrons. While the First Division was here the 95th and 94th pursuit squadrons collected their planes and carried out various programmes of a training nature. About the middle of March the first patrol over the lines was made, and on April 14th the first enemy plane was brought down.

In connection with the training given the First Division in the Toul sector early in 1918, there operated the 1st, 12th, and 88th Aero Squadrons, which composed the American 1st Corps Observation Group. This observation group was organized in April, 1918, and in the early part of the month commenced operations over the front in the Toul sector. These squadrons had just been assigned to the front, were new to war conditions, but contained men of long experience in aviation. The work consisted of short and long range reconnaissance, artillery adjustment, and photographic missions, panel exercise for artillery and infantry, and liaison work.

At Cantigny Spad 42, a two-place Spad Squadron, French Air Service, took quite a few pictures at very low altitudes, which were valuable and interesting. This squadron did a lot of ground straffing and valuable work in locating the lines. The same squadron operated at Soisson, doing the same kind of work. There they suffered very heavy losses in their ranks in their attempt to protect and serve our First Division.

On July 18, 1918, the First Division took a most important and principal part in the counter offensive at Soissons, but was served in this operation by the French Aero Squadrons.

All of the Air Service units assigned to the First Army had moved into position before September 12th. The actual operation of wiping out the St. Mihiel salient required but four days, September 12 to 15, 1918. On the first three days the weather was extremely bad, but it did not prevent the American Squadrons from flying, though seriously interfering with the program. Throughout all daylight hours, whenever it was possible to fly, artillery surveillance, infantry contact patrols, and long range army reconnaissance missions were undertaken.

General John J. Pershing
(C) Underwood and Underwood

Particular credit is due the corps and Army Air Service pilots and observers for their gallantry in flying in most unfavorable weather, including rain and high winds, during the St. Mihiel operation. The Army observation penetrated as far as 60 kilometers beyond the enemy's front line at a time when the rain was falling heavily and clouds prevented flying at an altitude higher than about 1000 meters.

On September 11, the day after the battle, and on the next two days, our pursuit pilots showed the value of fast, high-powered, single-seater airplanes for missions of visual reconnaissance in unfavorable atmospheric conditions. These pursuit pilots engaged in ground straffing and throughout the days of the attack particularly good work was done by our pursuit group in destroying enemy balloons. So well was this work done that it is doubtful whether the enemy received any information at all from his balloons on the western side of the salient.

Our planes also contributed by causing material damage and confusion in the rear areas. One of the efforts undertaken was a thorough reconnaissance and surveillance of the enemy opposite our sector, in order to keep our command informed of his movements and dispositions. Missions were sent out for this purpose daily at dawn and dusk, while other missions were dispatched throughout the day according to the existing conditions. All missions were quite definite. Great importance was attached to photographing enemy works and photographic work rapidly improved, including prompt development and interpretation of plates and location of points on terrain.

Effective close range reconnaissance of the enemy sector was made. Negative information furished by this group was of great value, as a constant watch was kept along the enemy front and any secret movement prevented. Visual reconnaissance and photographic missions were both fraught with difficulties and the enemy often endeavored to interfere with them. Nevertheless, our staff received timely and important information, the result of the work of this observation group during this period. In addition, artillery adjustments and contact patrols were undertaken.

Propaganda was dropped by our patrols over the enemy lines and to such good effect that two out of three prisoners captured by our troops had copies of this propaganda on their person.

In the preparation for the St. Mihiel offensive there was gathered under American command the largest concentration of air force ever collected by any adversary in the world. Nine American corps observation squadrons, three American observation squadrons, twelve American pursuit squadrons, three American day bombardment squadrons and fifteen American balloon companies participated. There were engaged a total of 1,481 Allied planes in this offensive. This was the first appearance of the American made DH-4 Liberty in an active engagement. The participants flew in fog, in downpour of rain and gales of wind.

The result of the famous St. Mihiel engagement is known to all.

In the Meuse-Argonne sector, in which the First Division participated from September 29 to October 11, the First Aero Squadron cooperated with the First Division. There is a coincidence in the association of this squadron again with the First Division. The First Aero Squadron, after operating with General Pershing on the Mexican

(*Continued on page* 22)

How the United States Air Mail Is Routed

Post Office Department's Planes Fly Nearly 2000 Miles a Day Carrying More Than 30,000,000 Letters with Considerable Time Savings

The New York and Washington route of the United States Air Mail Service, which was established May 15, 1918, carries an average of 5,000,000 letters a year from Washington and the Southern States and the same number southward from New England and the metropolis, with a gain of sixteen hours in delivery. The route is 218 miles by air, made in two and a half to three hours; by rail it is 226.8 miles, and train times run from 4:57 to 6:20 hours.

Letters from New York to the Pacific Coast are advanced a full day by the Air Mail; to Chicago the saving is sixteen hours. Cleveland has had the advantage of savings in time both eastward and westward since July 1, 1919, which connected the Cleveland-Chicago route, which was inaugurated May 15, 1919, with the eastern branch between Washington and New York.

From New York to Cleveland is 410 air miles, requiring four and a half to five hours; by rail, 620.6 miles, with 13:05 to 17:20 hours train time. Cleveland is 325 miles from Chicago, made in three and a half to four hours by plane; 340.3 miles and 6:55 to 10:30 hours by train.

Eight planes are in the air daily, flying 1,906 miles each day and carrying 2,100 pounds of first class mail, 84,000 letters. This amounts to more than 30,000,000 in a year. All mail is advanced in delivery from 16 to 24 hours.

The mail plane leaves New York between 5 and 6 a. m., with between 12,000 and 14,000 letters daily, including Sunday, and arrives at Cleveland about 10 a. m. and at Chicago about 1 p. m. the same day. The plane advances any letters mailed too late to leave New York on the 5:30 p. m. train and makes all noon carrier deliveries in Cleveland and all afternoon carrier deliveries in Chicago, as well as advancing connections to the middle West sixteen hours and to Seattle, San Francisco and Los Angeles twenty-four hours.

The mail plane at Cleveland in addition to mail originating in Cleveland takes about 14,000 letters daily from train 19, which leaves New York at 5:30 o'clock the afternoon before and is not due to arrive in Chicago until 4 p. m., too late for the regular carrier deliveries in that city. The airplane puts this mail in Chicago daily at 1 o'clock, usually a little before 1 p. m., and in time for all city carrier deliveries. It also makes train connections which would not have been made had the mail remained on the train at Cleveland.

The mail planes leave Chicago at 2:30 p. m., which is a considerable time after the departure of the Twentieth Century Limited, which train the mail plane overtakes at Cleveland with an hour to spare and deposits on that train Chicago city mail and mails from westbound connections. This mail then is delivered by the Twentieth Century Limited in New York City at 9:40 a. m. Had the letters not been placed on the train at Cleveland they would not have reached New York City the following day in time for the carrier deliveries.

The mail plane takes besides letters originating in Cleveland and destined for the East between 12,000 and 14,000 letters from train No. 90-28-32, which left Chicago at 11:31 p. m. the previous night, and delivers it at New York City usually around 1:30 o'clock that afternoon. Had this mail remained on that train it would not have arrived in New York City until 4:44 o'clock the following morning.

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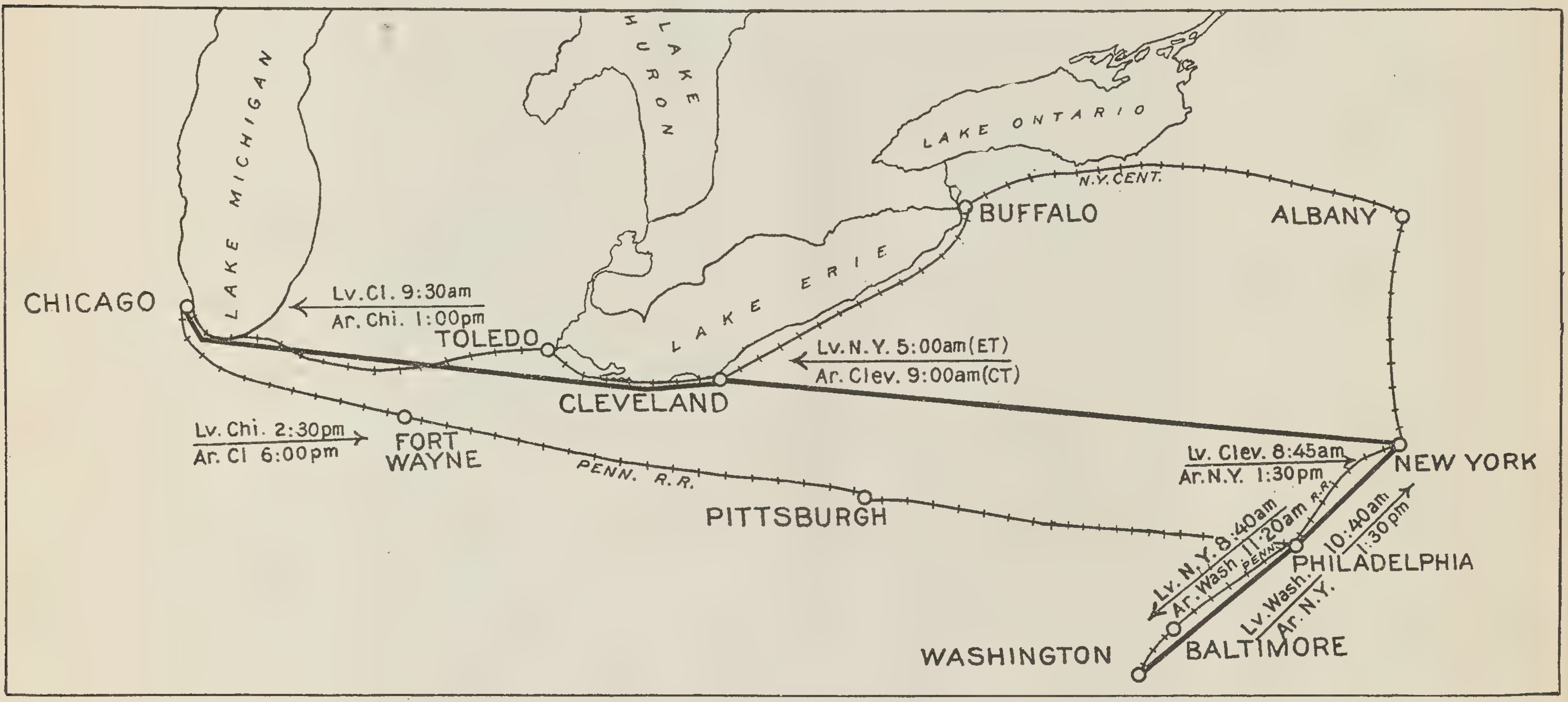
The mail plane leaves New York at 8:40 a. m. with New England midnight mail and New York City mail reaching the post office too late for the 1 a. m. dispatch for Washington, also New York up-State mail arriving on New York Central train 32, to the amount of 14,000 letters daily, which are turned over to the Washington postmaster in time for the noon and first afternoon deliveries.



United States Air Mail Routes

The mail plane leaves Washington at 10:40 a. m. with 14,000 letters daily to New York City, including Washington city letters mailed before 9:30 a. m., and New York City mail worked to carriers arriving in Washington on the Seaboard Air Line and Atlantic Coast Line trains from all the southeastern States from Virginia to Florida. This mail reaches New York by plane daily about 1:30 p. m. Had it continued by train to New York it would not have arrived in New York City in time to catch any carrier deliveries.

Flying across the mountains from New York to Bellefonte, Pa., has proved to be the most difficult route of the Air Mail Service. This is in part due to the fact that the valleys and cities are blotted out by the early morning ground fogs, leaving only the tops of the ridges exposed as landmarks to aviators. It is also due in part to the changeable velocity and direction of the winds over the 215 miles trip from Belmont Field on Long Island to Bellefonte in the heart of the mountains, due to the variety of topographical changes in the way of valleys and mountains. Also the greatest wind velocities are found during the summer time in that region. This is shown in the variations of speed of the fast planes of the Government's Air Mail Service.

Out of 101 trips, 39 were made at speeds ranging from 101 to 132 miles per hour, and 39 trips were made at speeds between 81 and 100 miles per hour. There were only 4 trips in a period of nearly two months, in which the wind was strong enough to hold the speed down to less than 60 miles an hour.

Major Schroeder Wins Derby Reliability Contest

Air Service Officer Attains Theoretical Percentage of 107.8 in Efficiency with Vought VE-7 Powered with Hispano-Suiza-150

International Film Service

Major R. W. Schroeder and the Vought VE-7

Major R. W. Schroeder, U. S. Air Service, has been declared winner of the reliability test in the International Air Derby for speed and reliability conducted between New York and Toronto two weeks ago under the auspices of the American Flying Club. Major Schroeder, who piloted a Vought VE-7 powered with a Hispano-150, was adjudged the winner with a percentage of 107.8 on the formula applied by the Derby's contest committee.

Second place in the efficiency test went to Major A. H. Gilkeson, in a JN-4H, with a Curtiss OX engine, 90 hp., who was given a percentage of 106.0. Curtiss JN planes made excellent showings throughout, Lieut. W. R. Taylor, Capt. H. B. Chandler, R. H. Depew and C. S. Jones finishing third, fourth, fifth and seventh, all piloting planes of this type. Lieut. D. B. Gish, in a DH-4 with a Liberty-400, who was third in the speed figures announced in last week's Aircraft Journal, was sixth.

Because of the War Department ruling forbidding Army fliers to accept prizes in air contests, the cash prizes for reliability are to be divided among the first civilians: R. H. Depew, C. S. Jones, Ronald Rohlfs, S. S. Moore, L. W. Bertrang, C. A. Schiller, O. S. Parmer and W. C. Barker.

Roland Rohlfs, who had been disqualified for not circling the Buffalo control station when the speed results were announced, was reinstated when testimony was offered that he did make the necessary circle. His plane, a Curtiss Oriole with a K-6 150-hp. motor, won for him the first civilian prize for speed, finishing in sixteenth place, and the third civilian prize for reliability.

Lieut. B. W. Maynard, who was the winner of the speed test in a DH-4 with a Liberty-400, was rated ninth in the reliability test, because of the light load he carried. The British SE-5 planes, which showed up well in the speed contest, were given much lower places in the reliability figures because of the handicap placed upon them. The two German Fokker planes in the race finished twenty-third and twenty-ninth in reliability.

The American built De Havilands, powered by Liberty-400 h.p. engines, which captured eleven out of the first fifteen places in the speed tests, were dropped somewhat in the reliability results.

The system by which the handicap standing was worked out was by application of a formula to the ideal and actual performance of the contesting airplanes. By multiplying the machine's possible useful load by its still air speed and dividing it by the horse power an index number indicating ideal performance was obtained. By multiplying its actual useful load by its actual speed in the race and dividing it by the horse power an index number indicating its actual performance was found. The ratio of the actual to the ideal gave the plane's performance percentage.

"It was necessary," says the club's announcement, "for the club's contest committee to learn from government records the theoretical performance of each machine in the contest, flying with a maximum useful load, which includes gas, oil and passengers. This theoretical performance with maximum load was used as a basis for determining the relative performances of the individual machines with the load actually carried."

"The VE-7 was one of the war secrets of the Army Air Service, and little of its development has ever been made public. It came into existence just at the time of the armistice, designed as a specialized training ship, with great strength, reliability and precise flying qualities for 'stunt' work, which would permit a pilot to step from the VE-7 into a fighting scout without further training.

"The VE-7 which entered the race was wrecked a few weeks before the contest and had been repaired with parts taken from older VE-7 machines. Major Schroeder, who piloted this ship, is holder of this country's official altitude record. The ship carried a 150-horse power Hispano Suiza motor.

"The American Flying Club, a pilots' organization, which has taken the constructive initiative in conducting aeronautical sporting events, is utilizing the results of this race for a nation wide campaign for well-equipped municipal airdromes.

"Much has been learned from the recent competitions, but having demonstrated the fitness, reliability and comparable safety of aircraft for high speed, long distance travel, the Contest Committee officials announce that plans for an airplane race of spectacular character over a short course are being formulated. The tentative rules and regulations of this new race have been submitted to the aircraft manufacturers so that they can get their new designs ready in time. It is hoped to get enough surplus civilian owned machines so that Army and Navy pilots can fly in the race and participate in the prize money, which they could not do in the recent race.

"There were fifteen civilian pilots competing in the race and thirty-nine Army entries, a total of fifty-four machines, which is said to be the largest number which ever participated in an aeronautical contest anywhere. Of this number twenty-one Army and nine civilian planes finished, though three were disqualified for infraction of safety first rules at the obligatory landing stations.

"A dinner at which the prizes will be given the aviators will be held at the Hotel Commodore Sept. 15."

The results of the international Air Derby, which marked as well the first flights between the United States and Canada and brought about the delivery of the first international air mail between officials of both countries and the visiting Prince of Wales, were highly commendable in both speed and reliability. This is especially true when it is considered that the Derby was conducted under abnormal weather conditions that would certainly have prevented a ground race of similar character. Indeed, Major Schroeder's showing was considered so remarkable that for a time it was believed that he had a more powerful engine than a Hispano-150 in his plane. This was officially denied later.

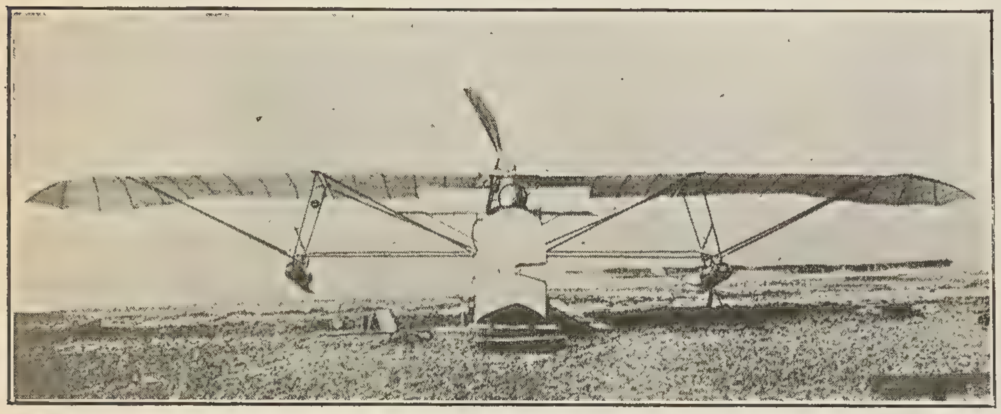
The reliability standing of the contestants follows:

Rel. Finish	Plane	Pilot	Per Cent	peed Finish
1	VE-7	Major R. W. Schroeder	107.8	9
2	JN-4H	Major A. H. Gilkeson	106.0	18
3	JN-4H	Lieut. W. R. Taylor	96.8	20
4	JN-4H	Capt. H. B. Chandler	90.8	21
5	JN-4D	R. H. Depew	90.5	22
6	DH-4	Lieut. D. B. Gish	85.2	3
7	JN-4D	C. S. Jones	82.3	19
8	Oriole	Roland Rohlfs	82.0	16
9	DH-4	Lieut. B. W. Maynard	80.9	1
10	Can. Tr.	S. S. Moore	78.6	23
11	DH-4	Lieut. M. J. Plumb	77.6	
12	DH-4	Lieut. Ben Adams	76.9	7
13	Can. Tr.	L. W. Bertaud	75.9	24
14	DH-4	Lieut. R. T. Midkiff	73.3	11
15	DH-4	Col. G. C. Brandt	73.0	4
16	DH-4	Lieut. W. C. F. Brown	72.3	13
17	DH-4	Lieut. H. H. George	70.0	2
18	SE-5A	Lieut. Charles Colt	65.2	14
19	DH-4	Lieut. Ross Kirkpatrick	58.8	12
20	DH-4	Lieut. F. T. Honsinger	58.5	15
21	Le Pere	Lieut. P. H. Logan	57.8	6
22	SE-5A	Col. H. E. Hartney	50.0	10
23	Fokker	Capt. C. W. Cook	48.8	17
24	Can. Tr.	C. A. Schiller	47.5	27
25	DH.4	Lieut. J. P. Roullot	46.6	8
26	JN-4H	Wallace Young	43.8	25
27	DH-4	Major J. W. Simons	37.8	28
28	Standard	O. S. Parmer	29.7	29
29	Fokker	Lieut.-Col. W. C. Barker	27.6	26

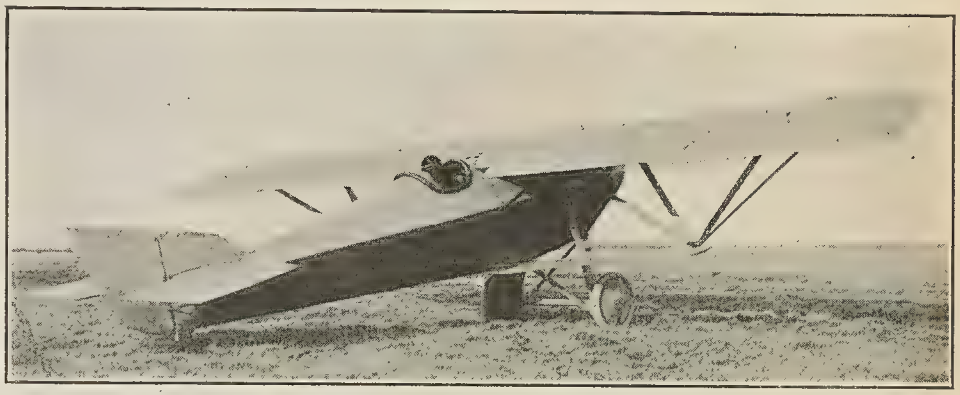
Development of the Rigid Truss Monoplane

Series of Photographs Submitted to Aircraft Journal by Grover C. Loening, Present an Interesting Study

In view of the present widespread interest, the following series of photographs submitted by Grover C. Loening is interesting as a study of development.



THE 1912 LOENING FLYING BOAT



STURTEVANT MODEL B SINGLE SEATER PURSUIT PLANE

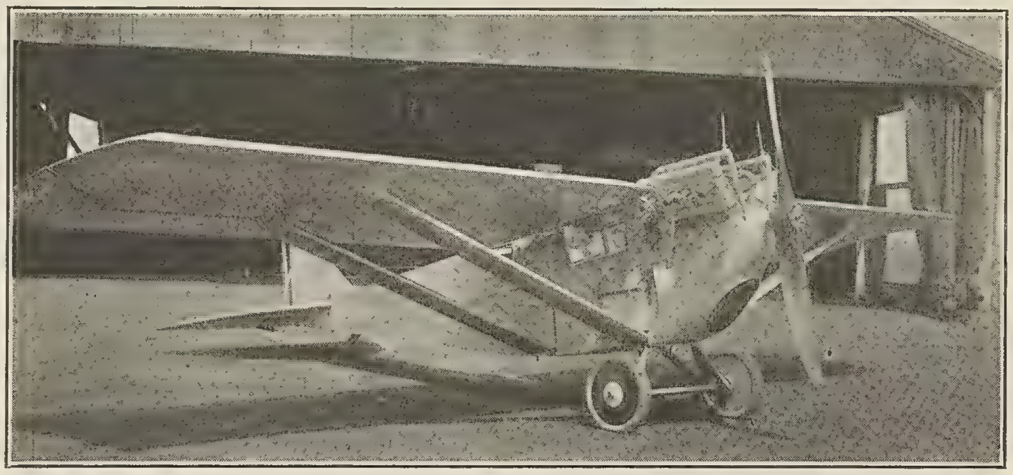
The first illustration shows an early Loening flying boat, on which construction was begun in 1911 and which was exhibited and successfully flown in 1912.

In 1915 Loening started construction of the Sturtevant Model B, a single seater pursuit monoplane, shown herewith. Several successful flights were made with this type.

More modern examples of the same type of construction are shown in the small monoplane seaplane of the two float type. The Loening Kitten with an A. B. C. motor, a very small and light experimental machine, developed a high speed in the air for a very low power.

Finally in the center is shown the well known Loening monoplane, two seater fighter, which has been officially adopted by the U. S. Navy for shipboard and Marine Corps use.

The series constitutes a persistent and able development, from the first of the experimental models to the present fighter.



THE LOENING MO MONOPLANE

Record for Schroeder

Major R. W. Schroeder set what is believed to be a new altitude record for a two-seater when he ascended to a height of 29,000 feet at McCook Field Sept. 6.

By his flight Major Schroeder exceeds the record he established alone in a Bristol fighter at McCook Field Sept. 18, 1918. At that time he established a world's record for altitude by ascending 28,900 feet. This record later was broken by Roland Rohlfs in a Curtiss Wasp triplane.

On August 2 last Major Schroeder set a new world's record for speed at high altitudes. On this occasion he sped 137 miles an hour at an altitude of 18,400 feet, carrying with him as passenger Lieutenant G. W. Elfey. In making this record he flew a Le Pere fighter equipped with a Liberty motor and a supercharger. The supercharger feeds compressed air into the carbureter at the same pressure as at sea level.

Major Schroeder was the winner of the New York-Toronto reliability test.

Representative Dent's Bill

The bill for the reorganization of the Army introduced by Representative Dent in the House on Aug. 28 makes many changes of vital importance in the Air Service, the main difference being that officers above the grade of captain shall be permanently commissioned in the Air Service.

The organization of the Air Service follows:

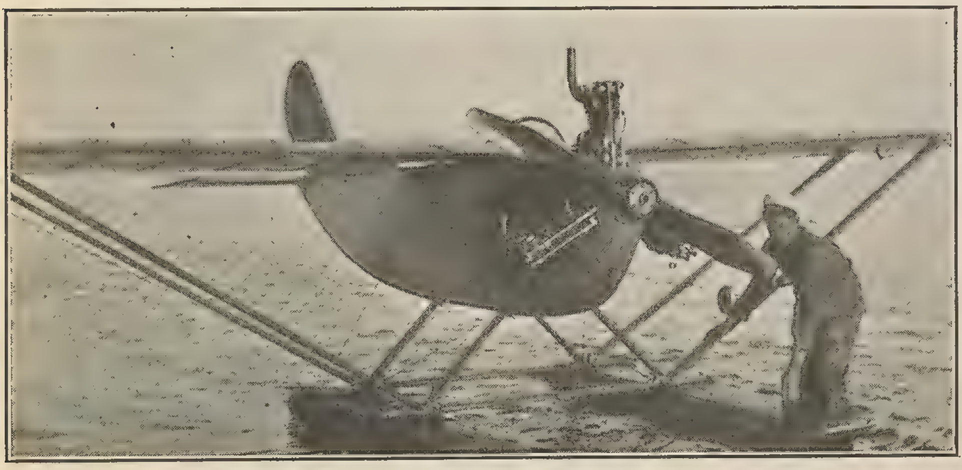
"SEC. 13a. THE AIR SERVICE.—The Air Service shall consist of 1 major-general, 1 brigadier-general, 11 colonels, 23 lieutenant-colonels, 63 majors, 219 captains, 348 first lieutenants, 297 second lieutenants, 257 master electricians, 1142 sergeants (first class), 868 sergeants, 67 mess sergeants, 1242 corporals, 67 buglers (first class), 1369 wagoners, 292 cooks, 2183 privates (first class), 67 buglers, and 3392 privates."

The other provision regarding the detail of officers is as follows:

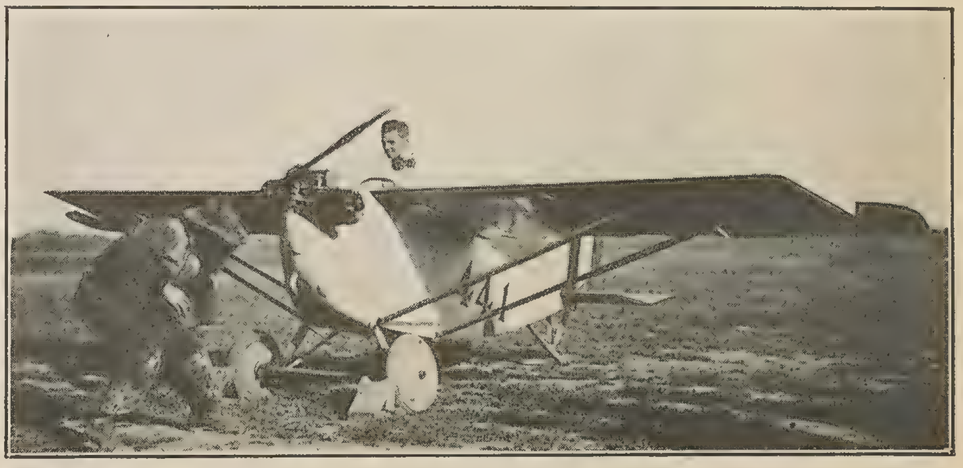
"SEC. 25d. Officers in the Ordnance Department, Signal Corps, Air Service, Tank Corps and Quartermaster Corps above the grade of captain shall be permanently commissioned in such corps, department or service. Below the grade of major, vacancies shall be filled by detail in the manner prescribed by existing law.

"SEC. 25e. Original vacancies created by this Act in all grades below brigadier-general of the Chemical Warfare Service, in all grades between captain and brigadier-general of the Air Service, Tank Corps and Signal Corps, and in the grades of captain and first lieutenant of Infantry, captain and first lieutenant of Engineers, first lieutenant of Cavalry, and first lieutenant of Field Artillery, major and captain of the Quartermaster Corps, and major of the Judge Advocate General's Department shall be filled by appointment from among officers now holding commissions in the Regular Army from persons who served honorably in the temporary forces of the United States organized since April 6, 1917, and from persons in civil life.

"SEC. 25f. No appointment be made until the appointee shall have been pronounced fit for such appointment by a board of officers.



LOENING MONOPLANE SEAPLANE OF 1917



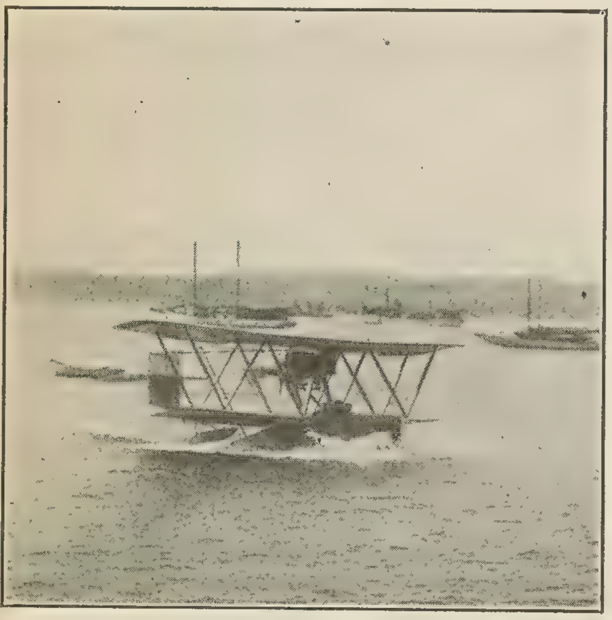
THE LOENING "KITTEN" MONOPLANE

Vought Model VE-10 Makes Its Appearance

One of Most Promising Commercial Planes Is Three-Place Flying Boat Given Initial Tests During Past Weeks

One of the most promising commercial airplanes to make its appearance since the armistice is the new three-place flying-boat brought out by the Lewis & Vought Corp., which was tested on August 2 by James A. Taylor, jr., and Caleb S. Bragg at Port Washington, Long Island.

Since the initial trials the VE-10 has been given exhaustive flight tests by Commanders McDonald and Griffin of the U. S. Naval Air Service and Lieut.-Col. Harold E. Hartney, U. S. A., all of whom expressed themselves as pleased with its characteristics.



VE-10 Returning; Three on Board

The design is a distinctly new development in aeronautical engineering and was evolved, as explained by Chance M. Vought, president of the Lewis & Vought Corporation, primarily to create and stimulate interest in flying and in addition to satisfy the steadily increasing popular demand for a very reliable, safe and efficient hydro-airplane that can be obtained at reasonable first cost and be inexpensively operated. It is Mr. Vought's observation that first costs and low operation expense are the most important factors in commercial aviation and that future progress depends largely on reliability and safety and on how much initial and upkeep costs are reduced.

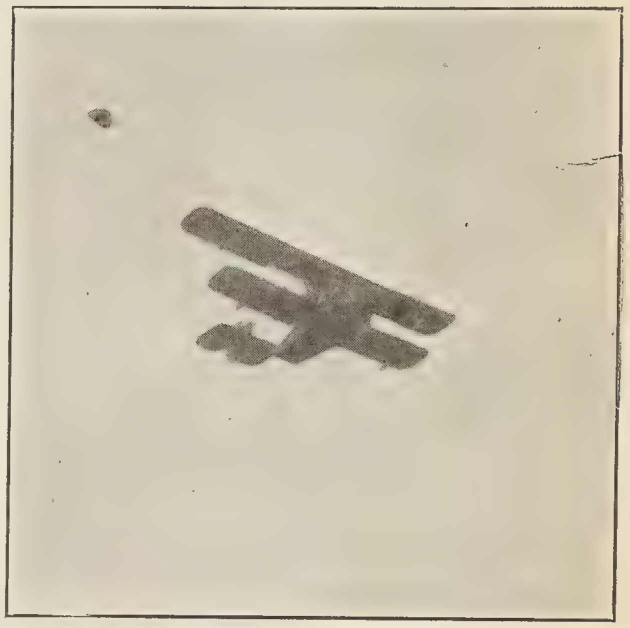
"Airplanes will not become popular," he said, "if the cost items remain exorbitant, because then only very wealthy people will be the ones who can afford to fly, and, therefore, production of commercial aircraft would remain greatly restricted. A low priced machine that is properly designed for reliability and efficiency, with all of its parts readily accessible so they can be easily inspected and repaired, is the type of airplane that is required."

The VE-10 is a noteworthy attempt to produce a reliable airplane to fulfill these requirements at low costs. It is of the pusher biplane type, with three seats and one 90-h.p. OX-5 engine, which is located in the cellule center and rests on a novel engine supporting system. It is planned to sell the machine complete with engine at a low price, which is made possible by clever designing, extreme simplicity of all details throughout the construction, and improved production methods.

This machine, the VE-10, represents the same precise designing and exceptional performance attainments as did the initial units of the famous VE-7 standardized advanced training airplane. The first samples of the VE-10 were perfectly balanced, maneuvered splendidly, showed efficiencies heretofore unattained in flying-boats, were light on controls and have required no mechanical or detail changes or adjustments in the hydro-airplane structure or the design itself. A uniform factor of safety of 7 plus is guaranteed by the manufacturers of the machines.

The tests demonstrated that the VE-10 is highly efficient for its carrying capacity and horsepower. It behaves splendidly on the water, is absolutely dry and makes a get-away with full load in a surprisingly short distance. The low and high speeds (at sea level) are 46 and 80 miles per hour, respectively. The climbing rate if 2,650 feet in ten minutes with full load, consisting of a pilot, two passengers and two and one-half hours fuel and oil. The gross weight, which includes a useful load of 625 pounds, is 1,968 pounds. The performance of the VE-10, it is claimed, surpasses that of present water machines of equal power, and compares favorably with that of flying-boats carrying the same useful load, though equipped with considerably more power.

The VE-10 has the pleasing proportions of a well balanced design. The workmanship throughout is excellent. The wings and control surfaces are doped and coated with gray enamel, the same as used on the VE-7 standardized airplanes; the woodwork, including the outside of the hull, is amber varnished, five coats, and the fittings are black or gray enamel baked. All cables and wires are coated with blue rust-proof marine paint.

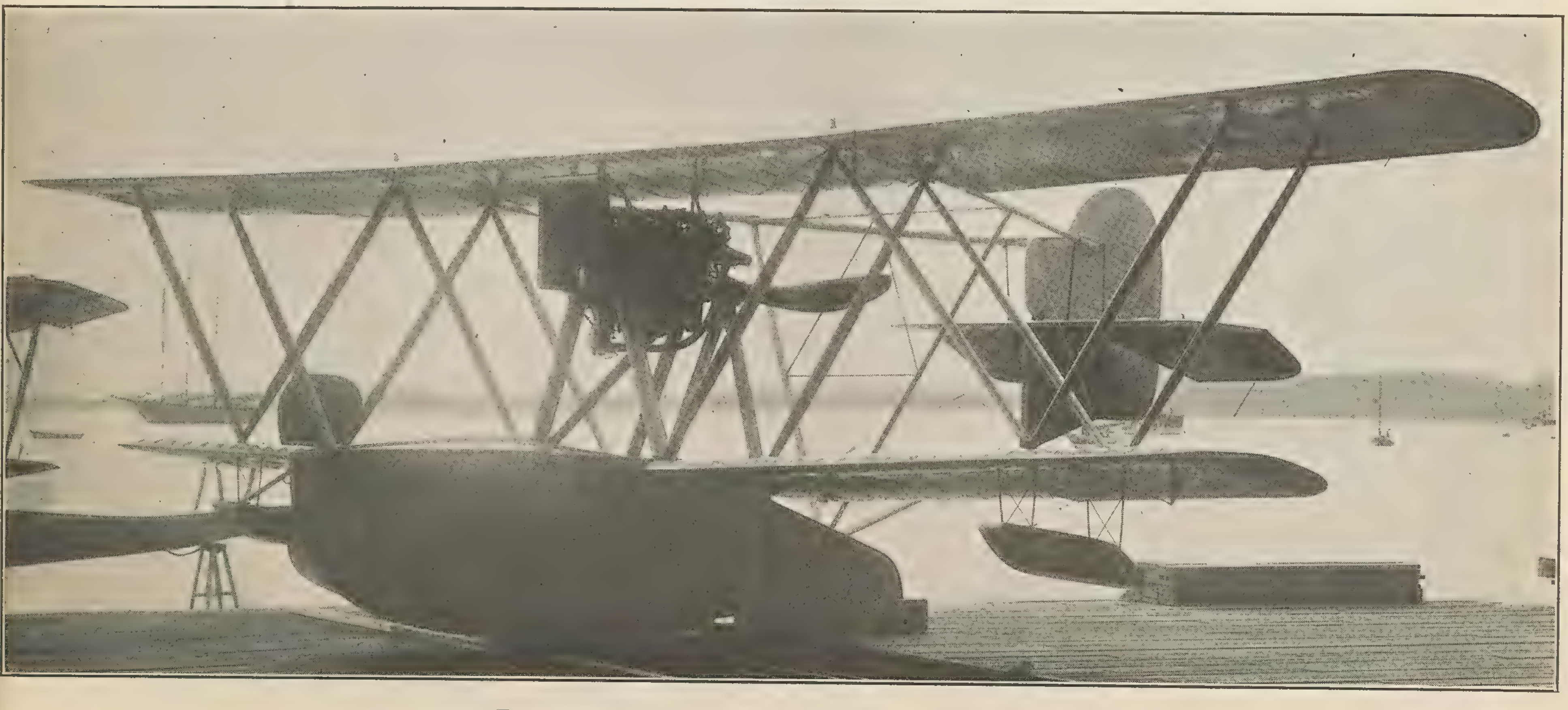


Vought Boat in the Air

On first glance from a distance one would take the machine to be one of the Navy's trans-Atlantic flying-boats, since it has a short hull and three boom outrigger tail, but closer inspection discloses many novel departures and improved features in design.

In place of the conventional Pratt truss the wings have a Warren truss. This truss has no lift and landing stays, since the struts are inclined to each other in the plane of the spars and function for both tensile and compressive stresses. The Warren is a modern bridge truss and has the merit

(*Continued on page* 18)



Three-Quarter Front View of New Vought Flying Boat

Peace Treaty Convention Relating to Aeronautics

Annexes D to "Convention Relating to Air Navigation"
Begins in This Issue—Subsequent Annexes to Follow

Annex D

RULES AS TO LIGHTS AND SIGNALS.
RULES OF THE AIR.

Definitions

The word "aircraft" comprises all balloons, whether fixed or free, kites, airships, and flying machines.

The word "balloon," either fixed or free, shall mean an aircraft using gas lighter than air as a means of support, and having no means of propulsion.

The word "airship" shall mean an aircraft using gas lighter than air as means of support, and having means of propulsion.

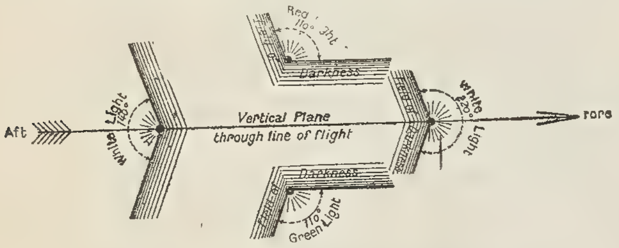
The words "flying machine" shall mean all aeroplanes, seaplanes, flying boats, or other aircraft heavier than air, and having means of propusion.

An airship is deemed to be "under way" within the meaning of these rules when it is not made fast to the ground or any object on land or water.

1

Rules As To Lights

The word "visible" in these rules when applied to lights shall mean visible on a dark night with a clear atmosphere. The angular limits laid down in these rules as shown in the sketch (attached) shall be determined when the aircraft is in its normal attitude for flying on a rectilinear horizontal course.



Sketch Plan of Lights on Aircraft

1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited. The prescribed navigation lights must not be dazzling.

2. A flying machine, when in the air or manœuvering on land or water under its own power shall carry the following lights:—

(*a.*) Forward, a white light visible in a dihedral angle of 220 degrees bisected by a vertical plane through the line of flight, and of such a character as to be visible at a distance of at least 8 kilometres.

(*b.*) On the right side, a green light so constructed and fixed as to show an unbroken light between two vertical planes whose dihedral angle is 110 degrees when measured to the right from dead ahead, and of such a character as to be visible at a distance of at least 5 kilometres.

(*c.*) On the left side, a red light so constructed and fixed as to show an unbroken light between two vertical planes whose dihedral angle is 110 degrees when measured to the left from dead ahead, and of such a character as to be visible at a distance of at least 5 kilometres.

(*d.*) The said green and red side lights shall be fitted so that the green light shall not be seen from the left side, nor the red light from the right side.

(*e.*) At the rear, and as far aft as possible, a white light shining rearwards and visible in a dihedral of 140 degrees bisected by a vertical plane through the line of flight and of such a character as to be visible at a distance of at least 5 kilometres.

(*f.*) In the case where, in order to fulfil the above conditions, the single light has to be replaced by several lights, the field of visibility of each of these lights should be so limited that only one can be seen at a time.

3. The Rules determined for the lighting of flying machines shall apply to airships subject to the following modifications:—

(*a.*) All lights shall be doubled; the forward and aft lights vertically, and the side lights horizontally in a fore and aft direction.

(*b.*) Both lights of each pair forward and aft shall be visible at the same time. The distance between the lights comprising a pair shall not be less than 2 metres.

4. An airship, when being towed, shall carry the lights specified in paragraph 3, and, in addition, those specified in paragraph 6 for airships not under control.

5. (*a.*) A flying machine, or airship, when on the surface of the water, and when not under control, that is to say, not able to manœuver as required by the Regulations for the Prevention of Collisions at Sea, shall carry two red lights not less than two metres apart one over the other, and of such a character as to be visible all around the horizon at a distance of at least three kilometres.

(*b.*) The aircraft reefrred to in this paragraph, when not making way through the water, shall not carry the side lights, but when making way shall carry them.

6. An airship which from any cause is not under control, or which has voluntarily stopped her engines shall, in addition to the other specified lights, display conspicuously two red lights, one over the other, not less than 2 metres apart, and constructed to show a light in all directions, and of such a character as to be visible at a distance of at least 3 kilometres.

By day an airship, when being towed, which from any cause is not under control, shall display conspicuously two black balls or shapes, each 60 cems. in diameter, placed one over the other not less than 2 metres apart.

An airship moored, or under way but having voluntarily stopped its egines, shall display conspicuously by day a black ball or shape, 60 cms. in diameter, and shall be treated by other aircraft as being not under control.

7. A free balloon shall carry one bright light below the car at a distance of not less than 5 metres, and so constructed as to show an unbroken light in all directions, and of such a character as to be visible at a distance of at least 3 kilometres.

8. A fixed balloon shall carry in the same position as the white light mentioned in paragraph 7, and in lieu of that light, three lights in a vertical line one over the other, not less than 2 metres apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible in all directions at a distance of at least 3 kilometres.

In addition, the mooring cable shall have attached to it at intervals of 300 metres, measured from the basket, groups of three lights similar to those mentioned in the preceding paragraph. In addition, the object to which the balloon is moored on the ground shall have a similar group of lights to mark its position.

By day the mooring cable shall carry in the same position as the groups of lights mentioned in the preceding paragraph, and in lieu thereof, tubular streamers not less than 20 cm. in diameter and 2 metres long, and marked with alternate bands of white and red, 50 cm. in width.

9. An airship when moored near the ground shall carry the lights specified in paragraphs 2 (*a*) and (*e*) and 3.

In addition, if moored but not near the ground, the airship, the mooring cable, and the object to which moored, shall be marked in accordance with the provisions of paragraph 8 whether by day or by night.

Sea anchors or drogues used by airships for mooring purposes at sea are exempt from this regulation.

10. A flying machine stationary upon the land or water but not anchored or moored shall carry the lights specified in paragraph 2.

11. In order to prevent collisions with surface craft:—

(*a.*) A flying machine when at anchor or moored on the water shall carry forward, where it can best be seen, a white light, so constructed as to show an unbroken light visible all round the horizon at a distance of at least 2 kilometres.

(*b.*) A flying machine of 50 metres or upwards in length, when at anchor or moored on the water, shall in the forward part of the fiying machine carry one such light, and at or near the stern of the flying machine, and at a height that it shall not be less than 5 metres lower than the forward light, another such light. The length of a flying machine shall be deemed to be the overall length.

(*c*). Flying machines of 50 metres or upwards in span, when at anchor or moored in the water, shall in addition carry at each lower wing tip one light as specified in (*a*) of this paragraph.

The span of a flying machine shall be deemed to be the maximum lateral dimension.

12. In the event of the failure of any of the lights specified under these rules to be carried by aircraft flying at night, such aircraft shall land at the first reasonably safe opportunity.

13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any State with respect to the additional station or signal lights for two or more military aircraft, or for aircraft in formation, or with the exhibition of recognition signals adopted by owners of aircraft which have been authorized by their respective Governments and duly registered and published.

II

Rules as to Signals

14. (*a*). Aircraft wishing to land at night on aerodromes having a ground control shall before landing:

Fire a green Very's light or flash a green lamp, and in addition shall make by international Morse code the letter-group forming its call-sign.

(*b.*) Permission to land will be given by the repetition of the same call-sign from the ground, followed by:

A green Very's light or flashing a green lamp.

15. The firing of a red Very's light or the display of a red flare from the ground shall be taken as an instruction that aircraft are not to land.

16. An aircraft compelled to land at night shall before landing fire a red Very's light or make a series of short flashes with the navigation lights.

17. When an aircraft is in distress and requires assistance, the following shall be the signals to be used or displayed, either together or separately:

(*a*) The international signal, SOS, by means of visual or wireless signals.

(*b*) The international code flag signal of distress, indicated by NC.

(*c*) The distant signal, consisting of a square flag having either above or below it a ball, or anything resembling a ball.

(*d*) A continuous sounding with any sound apparatus.

(*e*) A signal, consisting of a succession of white Very's lights fired at short intervals.

18. To warn an aircraft that it is in the vicinity of a prohibited zone and should change its course, the following signals shall be used:

(*a*) By day: three discharges, at intervals of ten seconds, of a projectile showing on bursting white smoke, the location of the burst indicating the direction the aircraft should follow.

(*b*) By night: three discharges, at intervals of ten seconds, of a projectile showing on bursting white stars, the location of the burst indicating the direction the aircraft should follow.

19. To require an aircraft to land, the following signals shall be used:

(*a*) By day: three discharges, at intervals of ten seconds, of a projectile showing on bursting black or yellow smoke.

(*b*) By night; three discharges, at intervals of ten seconds, of a projectile showing on bursting red stars or lights.

In addition, when necessary to prevent the landing of aircraft other than the one ordered, a searchlight which shall be flashed intermittently shall be directed toward the aircraft whose landing is required.

20. (*a*) In the event of fog or mist rendering aerodromes invisible, their presence may be indicated by a balloon acting as an aerial buoy and, or other approved means.

(*b*) In fog, mist, falling snow or heavy rainstorm, whether by day or night, an aircraft on the water shall make the following sounds signals with a sound apparatus:

1 If not anchored or moored, a sound at intervals of not more than two minutes, consisting of two blasts of about five seconds' duration with an interval of about one second between them;

2 If at anchor or moored, the rapid ringing of an efficient bell or gong for about five seconds, at intervals of not more than one minute.

III

Rules of the Air

21. Flying machines shall always give way to balloons fixed or free and to airships. Airships shall always give way to balloons, whether fixed or free.

22. An airship when not under its own control shall be classed as a free balloon.

23. Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing and angle of elevation of an approaching aircraft. If neither the bearing nor the angle of elevation appreciably change, such risk shall be deemed to exist.

24. The term "risk of collision" shall include risk of injury due to undue proximity of other aircraft. Every aircraft that is required by these rules to give way to another to avoid collision, shall keep a safe distance, having regard to the circumstances of the case.

25. While observing the rules regarding risk of collision contained in paragraph 24, a motor-driven aircraft must always manœuvre according to the rules contained in the following paragraphs, as soon as it is apparent that, if it pursued its course, it would pass at a distance of less than 200 metres from any part of another aircraft.

26. When two motor-driven aircraft are meeting end on or nearly end on each shall alter its course to the right.

27. When two motor-driven aircraft are on courses which cross, the aircraft which has the other on its own right side shall keep out of the way of the other.

28. An aircraft overtaking any other shall keep out of the way of the overtaken aircraft by altering its own course to the right, and must not pass by diving.

Every aircraft coming up with another aircraft from any direction more than 110 degrees from ahead of the latter—*i. e.*, in such a position with reference to the aircraft which it is overtaking that at night it would be unable to see either of that aircraft's sidelights, shall be deemed to be an overtaking aircraft, and no subsequent alteration of the bearing between

(*Continued on page* 20)

News of the Army and Navy Air Services

Rank Reductions Delayed

The great reduction in rank for all emergency officers and the discharge of all temporary officers, which was ordered to be completed by September 30, has been delayed by an order published by the War Department issued Sept. 5.

The details of the order follow:

"So much of Circular 350, War Department, 1919, as requires all emergency officers to be returned to their permanent grades by September 30, 1919, is revoked.

"Discharge of emergency officers will proceed as rapidly as their services can be spared.

"All, except such as are selected for retention in the event of approximately 8,500 emergency officers being authorized by legislation for the remainder of the fiscal year, are to be discharged by October 31. (The bill authorizes a total of 18,000 officers for the army.)

"Officers for duty with line organizations will be selected by station and organization commanders. All others will be selected by chiefs of staff corps and departments. Allotments and instructions for the purpose of selection will soon be issued.

"Officers under medical treatment for disability, incident to military service, will be discharged when maximum degree of restoration has been attained.

"Officers of the line may be discharged without being reported surplus. Officers of a staff corps will not be discharged until concurrence of the chief of such staff corps is granted.

"The period to which employment leaves under Circular 350 may be granted is extended to October 25."

Radio Training

A six months' radio course requiring at least three hours a day has been initiated by the Army Air Service in accordance with plans for vocational and educational training for the purpose of further training men attached to depot and service squadrons for radio duty. It aims to prepare the men with the proper qualifications for duty as radio operator mechanics and mechanic-operators until such a time as a radio training center is established.

The qualifications necessary for the personnel to be assigned to duty with field radio detachments are not difficult and embrace reading buzzer code for ten minutes, reading blinker code, sending code for ten minutes, examination in elementary electricity, erection of field stations, etc. The course will of necessity be very practical, only such theoretical grounding being given as is absolutely essential to grasping the subject under consideration.

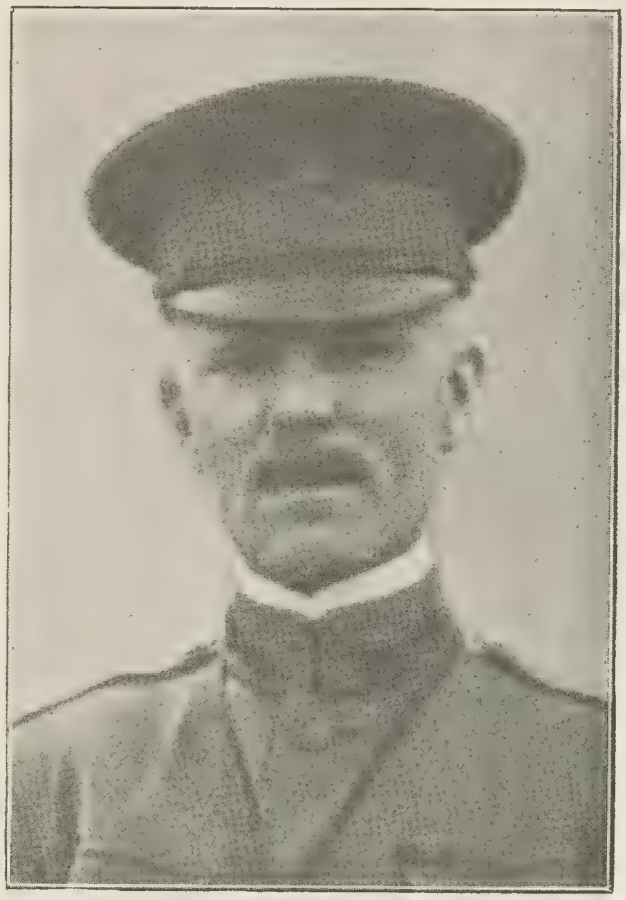
Posts in the Possessions

Information received at Air Service headquarters indicates that the Air Service stations in Hawaii, the Philippines and the Canal Zone will not be abolished as was anticipated for a time after the promulgation of War Department Circular No. 350, ordering discharge of all emergency officers after Sept. 30.

The passage by the House of Senate bill 2622 on August 29 removed all doubt from the minds of Army officers that the measure would eventually become law, and that such emergency officers as are needed in these projects might be retained indefinitely. All temporary fliers who are to be withdrawn from the Philippines, Hawaii and the Canal Zone have already received their orders to return to the United States. Those who have not received orders to return will be kept at these stations.

General Squier Honored

Major General George O. Squier was presented with the Distinguished Service Medal on Sept. 5. As the citation for this medal has not been given out it is not known whether it was given for work in connection with his work as Chief of the Aviation Section, Signal Corps, or as Chief Signal Office.



Major-General G. O. Squier
Photo J. N. Alley

Navy's Aviator Device

The Navy's aviator device has been changed, according to a recent announcement of the Navy Department, reading as follows:

"The present gold pin with double wings based on the shield and anchor will be worn only on wash summer uniforms. The winter uniforms will carry a similar device of gold embroidery. Provision has been made in a new regulation which designates student naval aviators and flying mechanicians. The student wears a pin similar to that of the graduate aviator, with the exception that one wing is removed, leaving a device similar to that worn by observers abroad.

"Regular members of seaplane flight crews among enlisted men will wear a pin similar to that of the student aviator, except that it shall be of silver. This change is made in the belief that there should be a distinctive insignia for graduate and student naval aviators, and further that flying mechanicians should also be entitled to wear some mark of distinction."

The Air Service of the Army is considering the abolition of the half-wing now worn by its observers for the reason that it is deemed an anachronism, is illogical and open to criticism on the ground that it is scarcely dignified to an officer to mark him as belonging to a service in which he is not assigned to certain duty, in fact, is marked to indicate his restricted duty. On the other hand there is criticism from the aesthetic standpoint that wings come in pairs and should never be used singly as a device.

Naval Speed Records

Naval speed records for pontoon seaplanes were broken recently by an H-A fighter in which Lieutenant-Commander N. H. White, Jr., U. S. N., commanding officer of the Naval Air Station, Hampton Roads, and Lieut. L. T. Barin, pilot, made a trip from Hampton Roads to the Naval Aircraft factory at Philadelphia. The course covered was approximately 270 miles and the time 135 minutes, or at the rate of two miles per minute.

The H-A fighter is a recent design in connection with the work of the Bureau of Construction and Repairs, and it is believed to be the fastest pontoon seaplane in existence. It is equipped with a Liberty 12-cylinder 335 h.p. motor and under favorable conditions will make 120 to 130 miles per hour.

During this flight the weather conditions were slightly unfavorable. Gusty side winds and fog banks were encountered and the visibility was very low. The flight was made at 1,500 feet altitude, except when crossing from the head of Chesapeake Bay to Delaware River, when the altitude was raised to 4,500 feet.

Air Service Manuals

Much has already been done in the collection of data and compiling of general valuable information. The Training Division has compiled and arranged manuals on the three important arms of the service, i. e., Bombardment, Observation and Pursuit, and besides has covered in the same form such subjects as Aerial Gunnery, Aerial Navigation, etc. These manuals are written for use as text books in training Air Service officers, and contain complete ground and flying curricula covering all subjects necessary in primary and advanced training to make finished pilots, bombers, observers and aerial gunners in all arms of the service. Arrangements have also been made to keep training data and methods up to date in its development by constant practice, experiment and by liaison with other branches of the government armament and with the Air Ministry of our friends across the water.

In compiling these volumes, all the experiences gained at the front in actual operations against the enemy, and all the methods used at home and abroad for training the specialists necessary to successfully perform the strenuous duties at the front, have been carefully reviewed and assimilated. All unimportant data and obsolete methods have been eliminated and an endeavor made in each case to segregate most approved methods and information, and to produce an interesting and highly instructive text book. The subject matter is presented in as clear and concise language as possible, with no attempt at verbosity. These manuals form an integral part of the Government confidential file and are for official use only.

Government Sells Linen

The Material Disposal and Salvage Division, Air Service, is asking for bids for the sale of about 125,000 yards of airplane linen of several widths and weights. The bids were to be received until Sept. 12, for either all or part of the yardage offered.

The linen was made in Irish mills and passed by the British Air Board, and was intended for use as airplane wings in American craft. It is pure linen, both warp and filling, and is available for a wide variety of uses; in fact, practically any use that is open for other linen.

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Wanted: A Far-Sighted Air Policy

ANYONE who is, if but superficially, acquainted with the schemes and actual status of air transport in Europe cannot help realizing that a few cardinal points begin to detach themselves from the seemingly chaotic state of post-war aeronautics.

The principal of these points is beyond doubt the absolute need of a well-planned system of suitable flying fields. That the safety of air transport requires aerodromes laid out with particular regard to atmospheric and topographic conditions is so obvious that it need not be stressed. However, while suitable landing grounds are excellent things *per se,* it is not generally realized that their principal value lies in location, with respect to the nearest centers of population. In other words, aerodromes will derive importance—and corresponding revenue—according to whether they answer the demand of local or general interests.

This means that the great future airways of America will have to be laid out in advance of the establishment of landing grounds, or the latter will ill fit into the general network of airways. Many of the now discarded Army flying fields, hastily established under the duress of war, were of this case and their abandonment thus does not constitute a loss to commercial aeronautics.

The laying out of America's principal airways is a task that deserves immediate official attention and, once careful consideration has been given to the manifold problems involved, prompt action. This work is one of considerable magnitude, one which demands above all a full comprehension of the present commercial possibilities of air transport and, even more so, a tolerable vision of the future. The latter requirement demands imagination and is therefore rather rare to find. Therefore, if, and when, the Government takes some action with a view to laying out our future airways prior to their organization in detail—and no doubt this should be a Federal prerogative—and some committee is appointed for this purpose, it will serve the broadest interests of this country to have some aviators, aeronautical engineers, and "ground officials" sit on that committee alongside transportation experts and Government officials.

Of course if by that time the proposed Air Department has become a reality—which is devoutly to be wished—the laying out of our airways would quite obviously come under the authority of the division of civil aviation.

However, pending such a happy outcome, it is to be hoped that the Government agency more directly concerned with air transport—it is quite difficult to say which one it is—will presently wake up to the realization that aircraft, though first revealed as machines of annihilation, can also be made to serve more constructive purposes.

Unfortunately it seems rather doubtful that such a realization should suddenly dawn upon one Government department; it is much more likely that nothing of the kind will occur unless Congress takes some sweeping action to give official sanction to the dictum that in the next war America's first line of defense will be in the air and that making due provision for such an occurrence is merely a matter of self-preservation. Consequently what is wanted above all from Congress is a far-sighted air policy, one based on the fact that aircraft have already broken down America's geographical isolation and that the situation thus created demands the development of a first-class air force and an adequate merchant air service—regardless of cost, and even at the expense of other services if it cannot be brought about otherwise.

Officers in the Air Service

THAT the General Staff has changed its mind regarding the detailing of officers from other branches of the Army to the Air Service is evident from the hearings before the Military Affairs Committees in Congress. The original intention was to place the Air Service on a par with the Ordnance or Signal Corps and have it composed exclusively of detailed officers. This would permit an officer to be in the Air Service for only a few years and then he would be returned to the branch in which he was commissioned. The inevitable result would be that all chance for promotion in his own service would be greatly diminished if promotion by selection is adopted, and if the seniority plan continues the officer would lose all of his efficiency due to his absence.

The plan to have younger officers or those under the grade of Captain detailed has some basis of sound practice. It requires some time to determine whether or not an officer can learn to fly and if he cannot he will prove of little value to the Air Service in the lower grades. The plan of commissioning directly from civil life or from ex-temporary officers is the best method for the lower grades.

The commissioning of officers of grades higher than that of Captain in the Air Service as a separate branch of the Army is the only possible plan of building up a service with an *esprit de corps* of its own. If the independent Air Service should be created this session all these problems would settle themselves.

Commercial Airplane Engines

IF the question were asked what the most important requirement of commercial aviation is at the present moment, the unhesitating reply would be commercial engines.

The war developed several types which constituted remarkable progress over pre-war types. The Liberty, the Hispano-Suiza, the relatively high-powered rotary motors served wonderfully well, and there are several other motors now on the market which can be immediately applied to commercial types of airplanes. The difficulty is, however, that the motors are too expensive, and although exceedingly well designed they are far from meeting the endurance requirements of commercial work.

What the builder of commercial aircraft now wants is an engine which will cost him much less per horse-power, than present engines, which will have an endurance two or three times as great as that of a war engine, and which will be, if possible, simpler to handle, and more readily accessible in the field.

A six-cylinder engine would have much to commend it over the twelve and the eight, on the grounds of simplicity. The possibility of using a single carburetor and avoiding difficulties of synchronization in a six are important advantages. It is significant that the Germans throughout the war consistently used the six.

Commercial motors would also seem to need a lower compression ratio than is at present customary. Their weight per horse-power could go up within certain limits.

We have been tacitly considering the water-cooled engine, but the air-cooled engine of small power would seem to have an exceedingly large field before it.

There is for engine designers a very stimulating prospect of difficult, but not insoluble problems. The solution of such problems would do far more for the commercial success of aviation than any other single factor.

Notes on Technical Aeronautics

Detachable Gasoline Tanks

The subject of fire prevention on airplanes is receiving considerable attention in this country. There is a tendency to have air intakes carried outside the engine fairing, to use smoke stacks, to avoid pressure delivery of fuel, to take all precautionary measures possible.

One very important foreign development, however, seems to have been neglected, namely,—the provision of detachable gasoline tanks.

Both in France and in England the problem of designing and constructing tanks detachable at the will of the pilot seems to have received considerable attention.

In some cases, instead of a detachable tank, rip patches have been used successfully. These consist of a panel sweated over a cut-out portion of the tank. One end of a patch is attached by a cable to a lever, which, when operated through its full stroke, entirely rips off the sweated patch, though this may require considerable effort by the pilot. In other cases, large openings are provided in the bottom of the tank, covered with a cap which is released by ripping off a band.

In one example of the detachable tank proper a one-point suspension is employed, the tank being held rigid by employing a fuselage construction into which the tank is wedged, so as to have a surface-bearing on several sides. The bottom of the tank has a panel which confirms and fits into the bottom bay of the fuselage, and takes the place of the cross-bracing wires which have necessarily been removed. Initial impetus at time of release is increased by use of tensioned elastic bands extending over the top of the tank and fastened on either side.

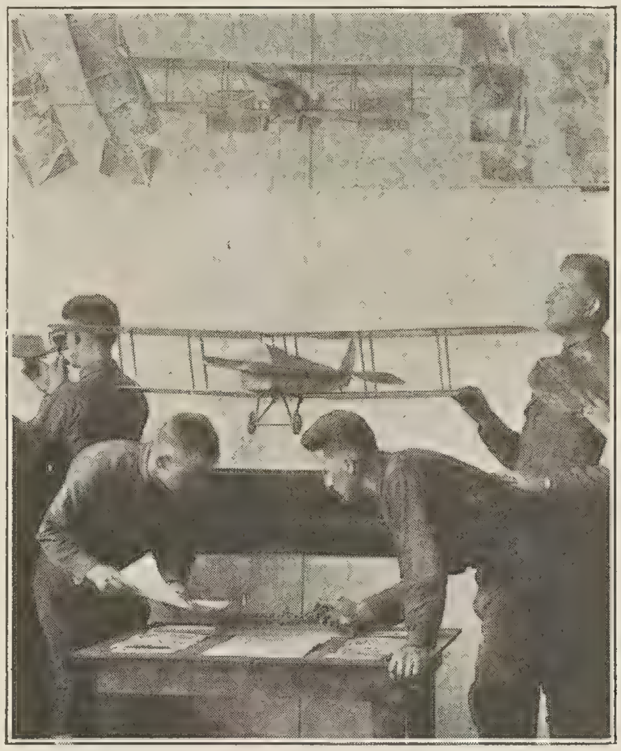
All these methods have disadvantages and do not offer a complete solution. Nevertheless they are worthy of study by American manufacturers, and of incorporation in American plans.

Pin-Pointing

As young as the science of aerial photography is, it is not so new as not to have acquired a fairly large vocabularly of words and phrases that are peculiar to it. A "pin-point" is an object on the ground such as a building, railway crossing or some other clearly defined landmark. When this object is viewed from an aircraft, many thousands of feet above, it is in truth only a point, and it has been the custom to term these objects when viewed under these conditions "pin-points." Photographing pin-points is called "pin-pointing." Catching these designated objects on a photographic plate is not at all easy, but the skill required and the fascination about the work are almost sufficient to class pin-pointing as a sport. Airplanes travel at a tremendous speed, and objects seem fairly to fly by. When a camera is held in the hand it can be leveled and "fired," but more often it is fastened in the bottom of the plane, with the lens pointing through an aperture that has been cut in the fuselage. When the camera is suspended in this way it is not quite as easy to sight it as when it is held in the hand.

At the School of Aerial Photography, located at Langley Field, near Hampton, Va., a miniature airplane is suspended over a small plaster relief map on the table. The strings that have been run from the little planes to the map indicate very clearly to the assembled students just what area on the ground cameras in the planes will cover when the planes are at different heights. As the camera when it is fastened in the plane points directly down through the aperture made in the bottom of the fuselage, the tilt of the plane in any direction will cause the camera to take an area on the ground very different from that which would be included if the plane were flying level, so that it will be seen that it requires skill and experience to know the exact moment when to make the exposure, as the wrong area on the ground will be included if the plane is diving, banking, rising or doing something other than flying level.

During battle the pin-points that are sought to be photographed are the important strategic positions held by the enemy and the vital things upon which depends the success of his operations, such as batteries, bridges, supply depots and the like. The aerial photographs made of these things are speedily finished and handed to the aerial bombers, who are able from the photographs to locate these works of the enemy and destroy them.



Instruction in Pin Pointing
Official Air Service Photo

In the making of photographs at the proper points and in sufficient number to cover a large area, certain pin-points are indicated so that they may be used in guiding the pilot and photographer. The photographs that cover a larger area when joined constitute a photographic mosaic. Obviously the individual photographs in a mosaic must be so taken that they will fit together properly, and therefore it is necessary for the photographer when making the photographs to observe very strictly the "control points." A control point is the name given a "pin-point" that is used when making the photographs necessary for a mosaic, or, in other words, making an aerial survey of an area.

The Air Service has enlisted a number of recruits for the Aerial Photographic Service. Upon enlistment men are sent to the School of Aerial Photography at Langley Field, Hampton, Va., where they are given a thorough and intensely interesting course in the new science of aerial photography, which includes pin-pointing and other kinds of fascinating, as well as practical, work from aircraft.

Helium Gas

Helium, the interesting gas employed in Navy dirigibles, was first identified in its spectrum in the solar chromosphere in the year 1868 by Sir J. Norman Lockyer, who gave to the hypothetical element the name of helium, but the actual discovery of the gas was made only in 1895 by Sir William Ramsay. The gas is relatively abundant in many minerals, all of which are active and contain uranium or thorium as important constituents. The richest known source is thorianite, which consists mainly of thorium oxide and contains 9.5 c. c. of helium per grain. It also occurs in minute quantites in the common minerals of the earth's crust, and is found almost universally in the gases which bubble up with the water of thermal springs, sometimes in a quite appreciable percentage.

All attempts to make helium enter stable chemical union have hitherto proved unsuccessful. The gas is in all probability only mechanically retained in the minerals in which it is found. It is this inertness which renders the gas so valuable in dirigible work, in spite of the fact that it is considerably heavier than hydrogen, its specific gravity relative to hydrogen being 1.98. The helium molecule like that of argon is monatomic and its molecular weight is 4. At standard atmospheric pressure and 62° F. air weights .0761, hydrogen .00529, and helium .00105 lbs. per cubic foot. For the same lifting capacity a helium dirigible has to have a volume 1.06 greater than a hydrogen airship, a negligible increase.

Rogers Magneto

A magneto for airplanes which meets all requirements of motors with from twelve to sixteen cylinders and, which it is claimed, increases the magneto area 200 per cent on twelve to sixteen-cylinder types and 300 per cent on the Liberty motor, has been developed by the Vita Manufacturing Co., 730 Williamson Building, Cleveland, Ohio.

The Rogers Magneto has no moving wires or revolving armature; the breaker is said to be of original design; condenser is puncture-proof-pitting eliminated; a hotter spark because of the manner in which the voltage and amperage is built up in the magneto field; coil is waterproof and the complete device is accessible and simple.

The Rogers magneto for twelve-sixteen cylinder gives four sparks for each revolution of the rotor shaft, and for the same motor of the two-spark type gives eight sparks per revolution. This magneto on the twelve-cylinder, two-spark Liberty motor delivers twelve sparks per revolution.

A striking feature of the 12-16 cylinder type is the fact that this two-pole type gives four sparks for each revolution of the rotor. This means that the Rogers magneto produces 40,000 sparks per minute at 10,000 revolutions per minute of the rotor shaft; the two-spark type for 12-16 cylinders produces 80,000 sparks per minute at the same rotor speed. The two-spark Liberty motor type produces 120,000 sparks per minute at same speed.

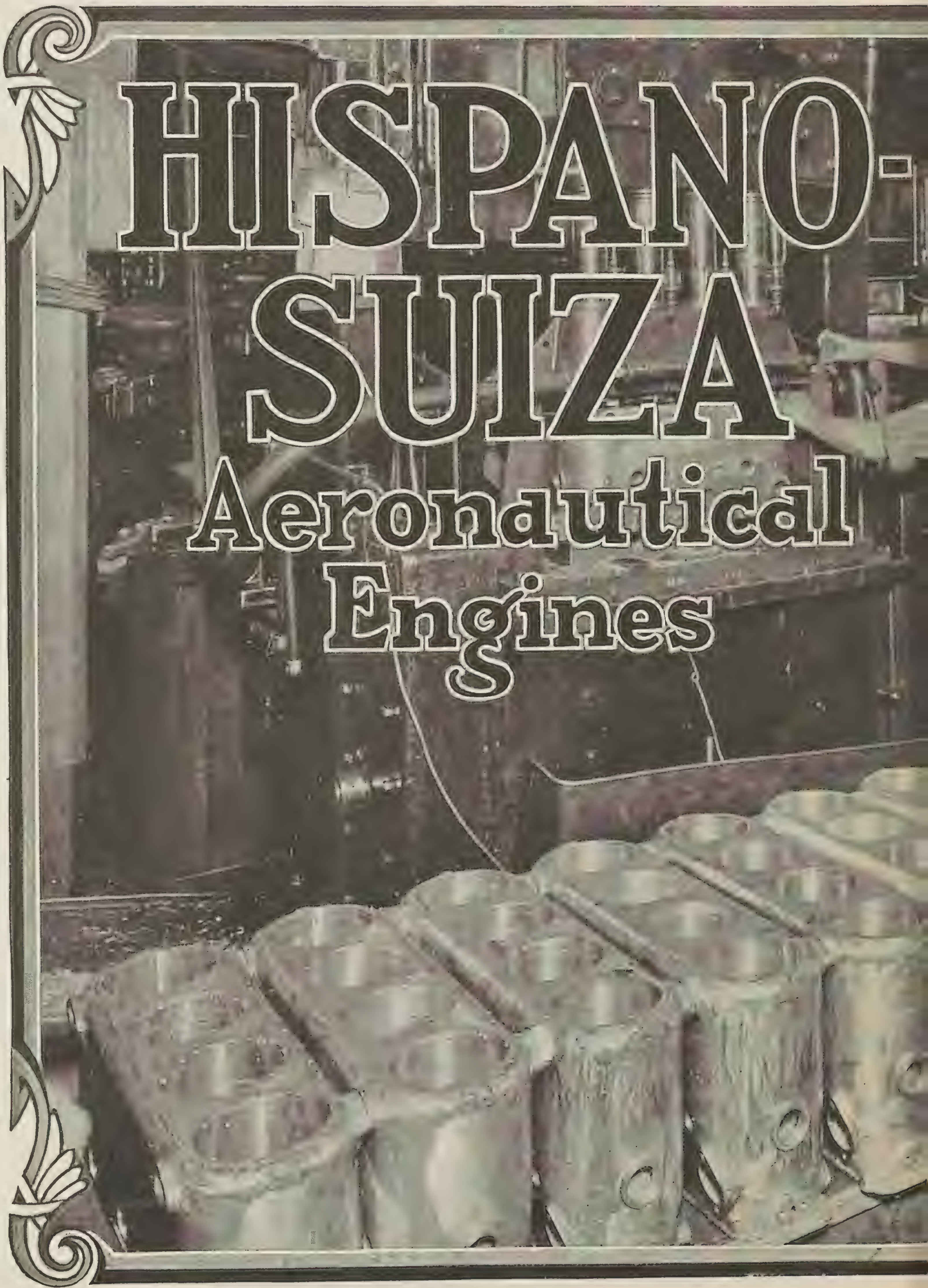
In recent Government tests made in Washington attempts were made to short circuit the Rogers by driving nails through the condenser. The magneto continued to function properly as it did after chunks had been cut from the condenser.

A process of impregnating coils makes them moisture proof. This feature has been proven by submerging the coils in water for a week, and, at the end of that time, they were torn down and found dry.

This magneto is designed by George D. Rogers, who has for years made a special study of ignition system for the internal combustion engine. Mr. Rogers was successively production engineer for the Peerless Motor Car Co., Winton Co. and the Continental Motors Co.

Germans Over Russia

A large German airship which is fitted out with a wireless telegraph outfit is making regular trips between Breslau and several towns in Russian Bolsheviki territory, according to a Warsaw dispatch, which asserts that the craft carries thirty passengrs. The airship has frequently been observed flying over Lemberg, Galicia.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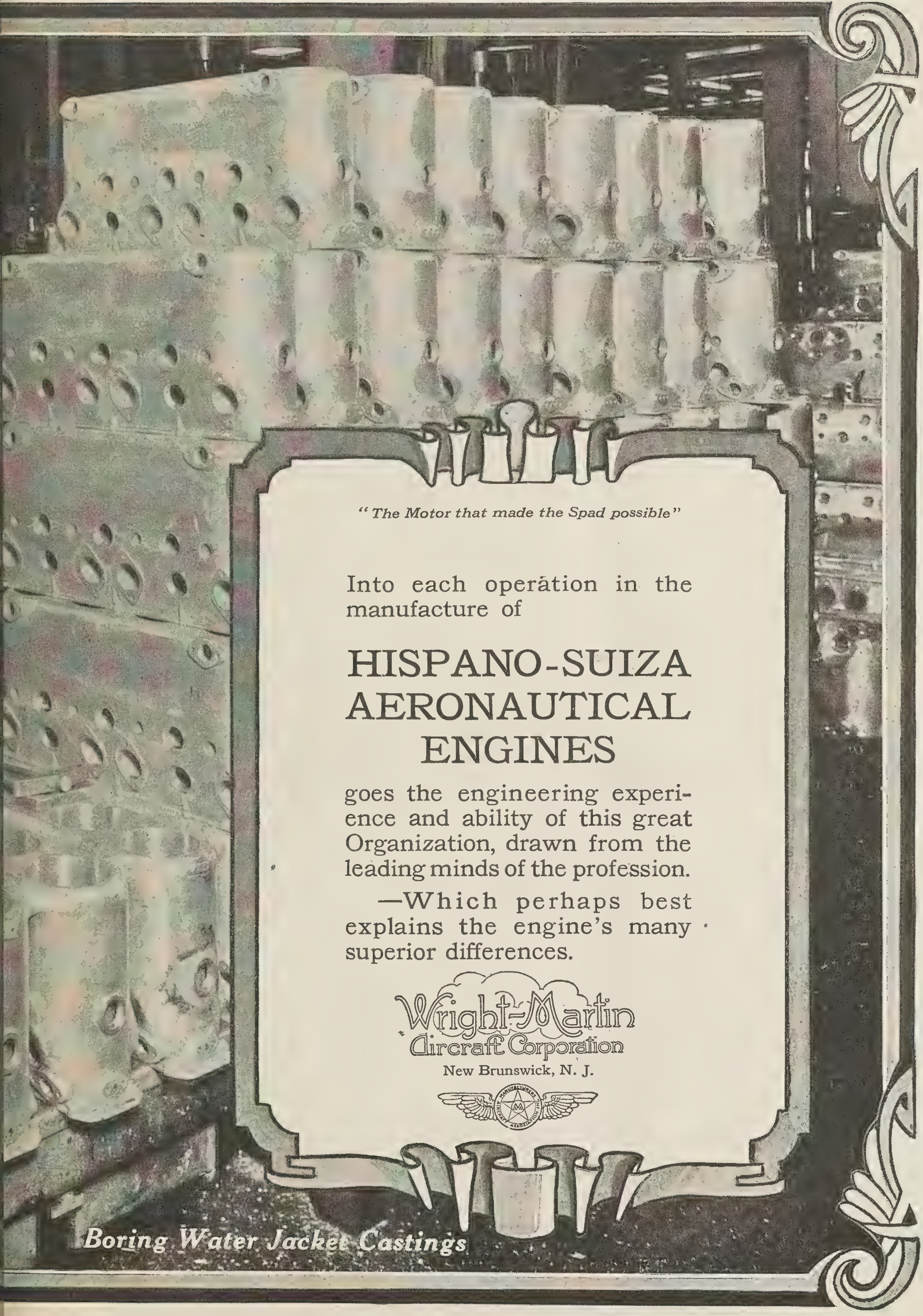

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Into each operation in the manufacture of

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goes the engineering experience and ability of this great Organization, drawn from the leading minds of the profession.

—Which perhaps best explains the engine's many superior differences.

Wright-Martin
Aircraft Corporation
New Brunswick, N. J.

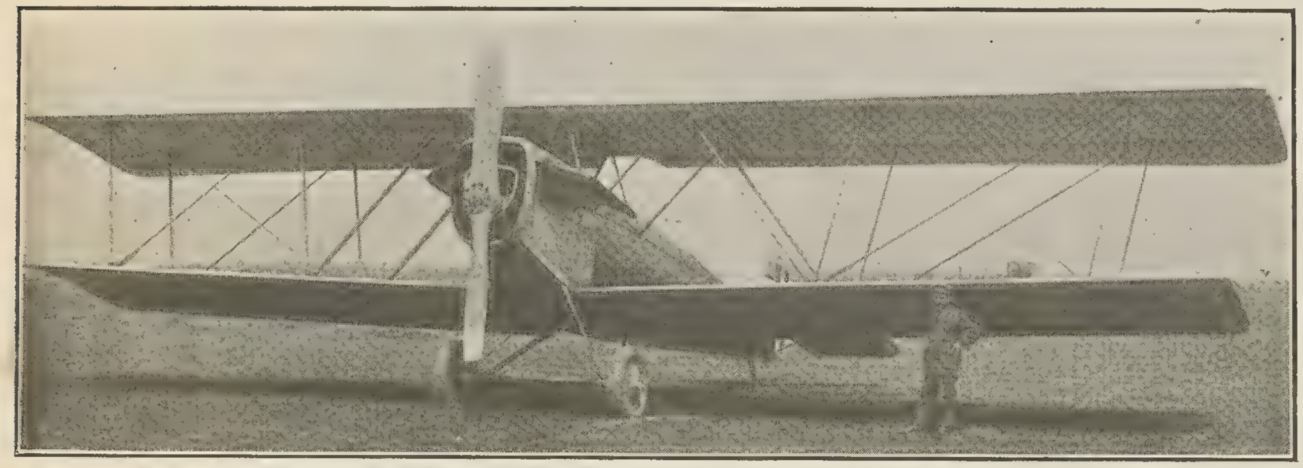
Boring Water Jacket Castings

Fast Fiat BR Flight

Lieutenant Brack-Papa, of the Italian army, pilot of the Fiat BR biplane, arrived at Amsterdam recently, having began his trans-Continental trip from Turin by a preliminary flight to Rome, which was accomplished in the record time of 2 hours 15 minutes, or at an average speed of 161 miles an hour.

Two days later Brack-Papa left Rome with the intention of flying to London without stop. He encountered a head wind in Italy, had a rough crossing over Mont Blanc, at a height of 20,000 feet, and met with low clouds and rain all the way over France. In consequence of these conditions he decided to land on the Villacoublay aerodrome, near Paris. The 1,000 miles from Rome to Paris were covered in seven hours and a half. After a day spent at Paris, Brack-Papa flew to London in one hour and three-quarters.

After being weather bound in London for a few days the Fiat pilot set out for Copenhagen, Brussels and Amsterdam. When flying between Calais and Boulogne it was necessary to land owing to a fractured intake pipe. This landing was made normally on the Marquise flying ground. Unable to start away again immediately, owing to weather conditions, the pilot remained at Marquise three days and finally flew to Amsterdam. The machine used for this trip is a Fiat biplane equipped with a Fiat 70-h.p. 12-cylinder engine and having a maximum speed of 165 miles an hour.



Type of Fiat BR Biplane for Which Speed of 163 M.P.H. is Claimed

Lawson Plane's Flight

The Lawson "Air Liner," built to carry twenty-six passengers, has reached Syracuse on its flight from Milwaukee to New York, to make a trans-continental flight westward.

The flight from Cleveland, which city the plane had reached Sept. 3, to Buffalo was accomplished without incident in three hours. Nine passengers were on board, six of them newspaper men.

From Buffalo to Syracuse the "Air Liner" carried eight men and a woman—all representing newspapers—in addition to the crew of five. The plane was damaged in making a landing on the soft rough field, the front of the car being smashed. Several days will be required for repairs before the plane can proceed. The plane has made the journey in slightly more than two hours.

Mexico Apologizes

The State Department has announced that the American Embassy in Mexico City, having formally called the attention of the Mexican Foreign Office to the firing by Mexican Federal soldiers on an American Army airplane, and the wounding of Captain McNabb, the pilot, near Laredo, Texas, the Mexican Foreign Office had expressed its regret and had promised an immediate and thorough investigation of the affair with a view to making "a satisfactory adjustment."

Two American aviation officers, on border patrol duty, were fired upon Sept. 2 by a group of Mexicans while flying up the Rio Grande, near here, and one of the officers was wounded in the head.

Capt. Davis B. McNabb was the officer wounded, and his companion, Lieutenant Johnson, brought the machine safely to earth on the American side. McNabb was taken to a farmhouse, and an airplane with a surgeon and medical supplies was rushed to his aid from American headquarters in Texas.

The officers were flying low about sixteen miles up the Rio Grande from here, near Santa Isabel Creek, when suddenly on the Mexican side, about twenty-five Mexicans rose up from the brush and poured volley after volley into the plane. It was reported several hundred shots were fired.

Continental Lines

The former Hamburg-American line, known as the "German Aerial Navigation Corporation," inaugurated regular passenger service between Berlin and Swiss resorts, commencing Aug. 18.

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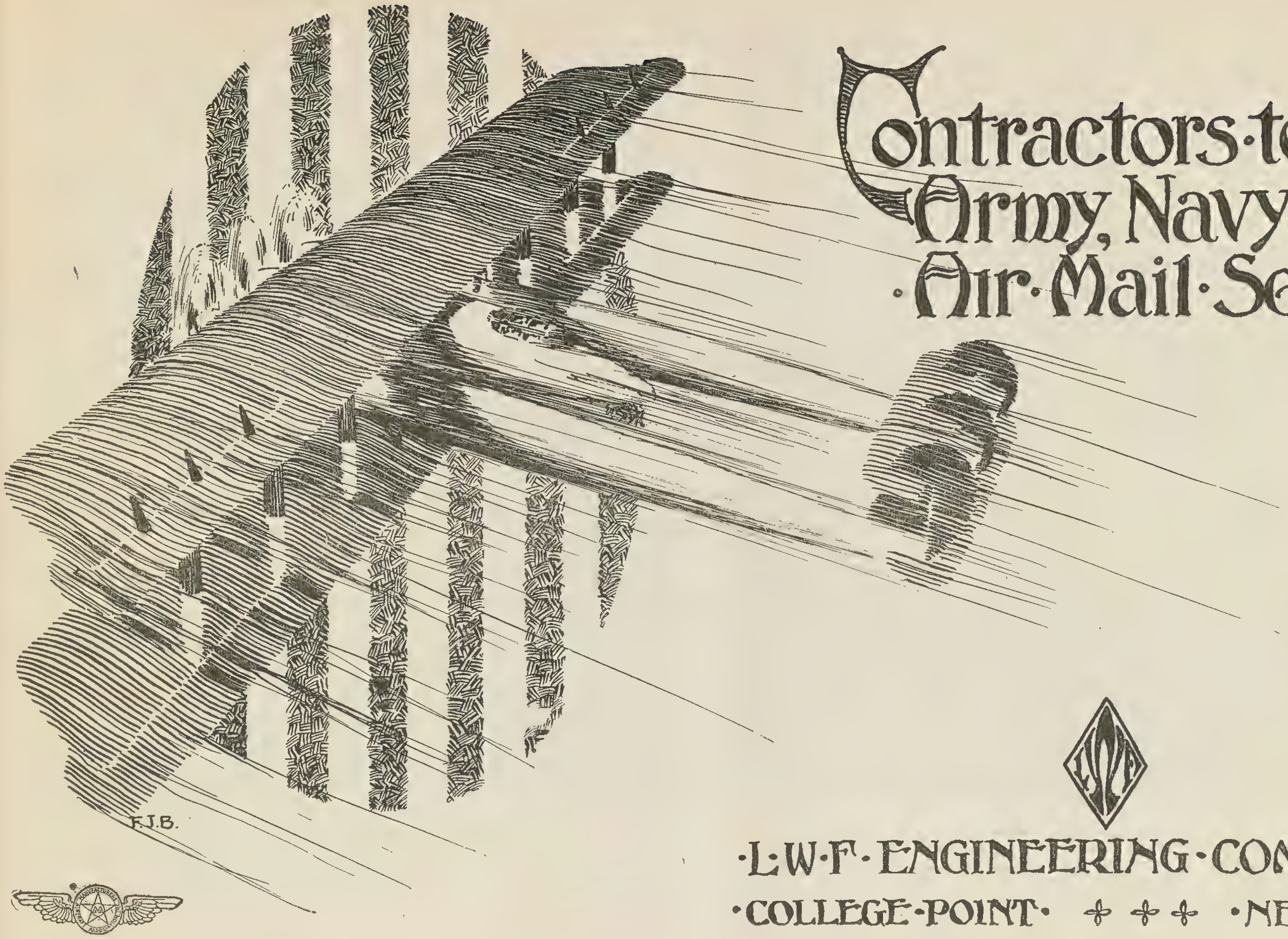

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Member Manufacturers' Aircraft Association

Recent "Bristol" Designs

The design of the "Bristol" Coupé and seaplane follow very closely that of the "Bristol" Fighter which proved so successful during the war. The inherent stability of the Fighter and its successes in aerial encounters on the Allied fronts in France, Italy, Egypt, Palestine and Salonica are widely known.

The "Bristol" Coupé is designed as a tandem two-seater, pilot forward; or as a three-seater, two passengers side by side, with pilot forward.

In consideration of the comfort of the passengers, easy chairs are placed in a totally enclosed cabin fitted with triplex glass windows on either side and affording complete protection from wind and rain. An air speed indicator and altimeter is fitted in the cabin as a matter of interest to the passengers while in flight.

The Coupé may be fitted with any of the following engines: Hispano-Suiza, 150, 180 or 300 hp.; Hall-Scott "L-6," 225 hp.; Rolls-Royce "Falcon III," 264 hp., or Siddly Deasey "Puma," 240 h.p. A large radiator is fitted to insure satisfactory cooling under constant service.

The "Bristol" Coupé has a cruising speed of 105 m.p.h. This speed is recommended in view of the fuel economy. Fuel capacity permits of 400-mile flight at an altitude of 5,000 feet. The following are the performances: speed, ground level, 125 m.p.h.; 5,000 ft., 122 m.p.h.; 10,000 ft., 113 m.p.h.; climb 6,000 ft., 5¼ minutes; 10,000 ft., 11½ minutes; 15,000 ft., 21½ minutes.

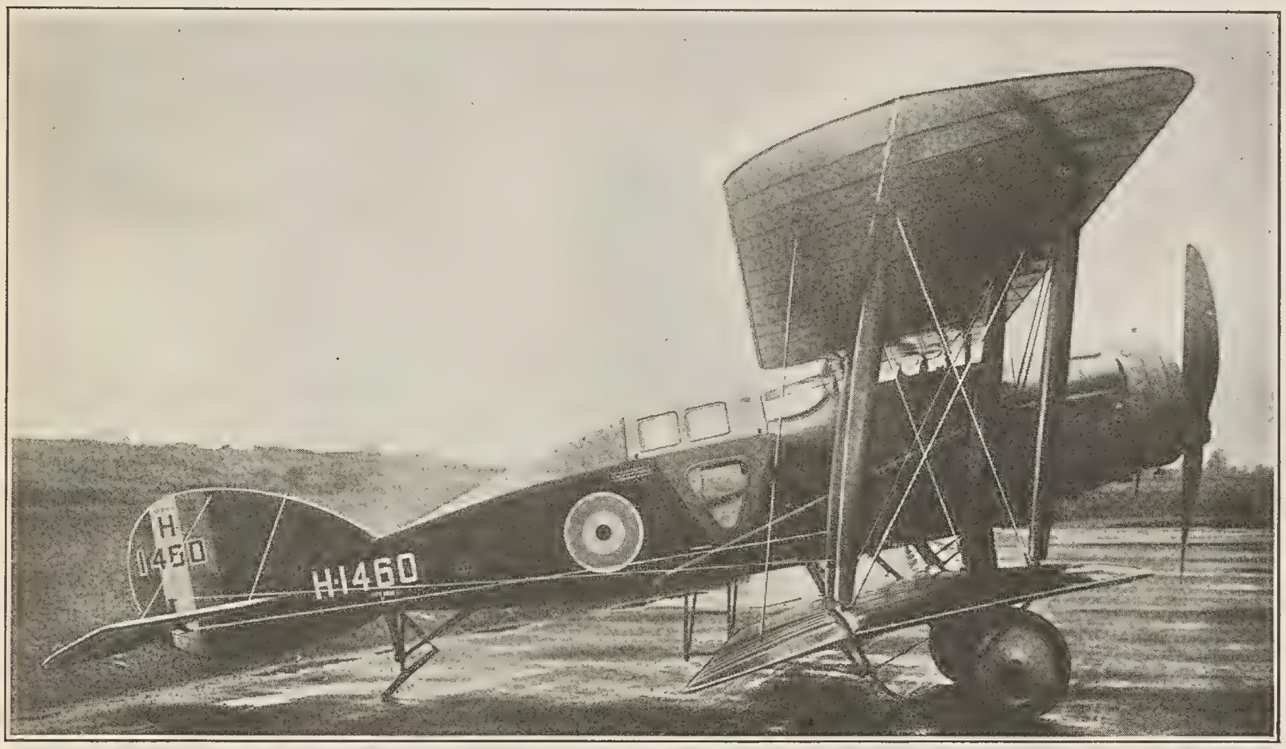
The following are weights and dimensions: weight, empty, 1,750 lbs.; weight loaded 2,800 lbs.; wing span, 29 ft. 3 in.; chord, 5 ft. 6 in.; overall length, 25 ft 9 in.; miximum height, 10 ft. 1 in.; wing area, 405 sq. ft.

In the event that mail or freight is carried in place of passengers a load of 450 lbs. can be carried with full fuel capacity for a 400-mile flight. The space available for cargo is 23 cu. ft. Dual control is installed so that either pilot or passenger may fly the machine with equal comfort.

The "Bristol" seaplane in design is practically the same as the Coupé, with the exception that two main floats are provided in place of the undercarriage. The floats are each divided into four water-tight compartments and are of such length that a tail float is rendered unnecessary. Water rudders are attached to rear of floats.

For commercial purposes the machine can carry a load of 300 lbs. in addition to passenger and pilot and fuel and oil sufficient for 4½ hours' flight. In cases where the pilot only is necessary the useful load of the machine is 500 lbs. and fuel and oil sufficient for 4½ hours' flight.

The machine has a speed of more than 90 miles an hour and lands at 47 miles per hour. Climb to 3500 ft. is made in 7 minutes; 6,500 ft. in 18 minutes. The seaplane may be fitted with any of the engines mentioned in connection with the "Bristol" Coupé.



THE NEW "BRISTOL" COUPE

Planes on Schedule

Despite bad weather on the British side of the English channel, with clouds hanging so low that they wreathed the hill tops, the new London-Paris air service completed Sept. 5 the eleventh day of regular operation exactly on schedule.

Twenty-eight flights have been made since the daily service began on August 25, with only one forced landing, which caused a delay of ten minutes.

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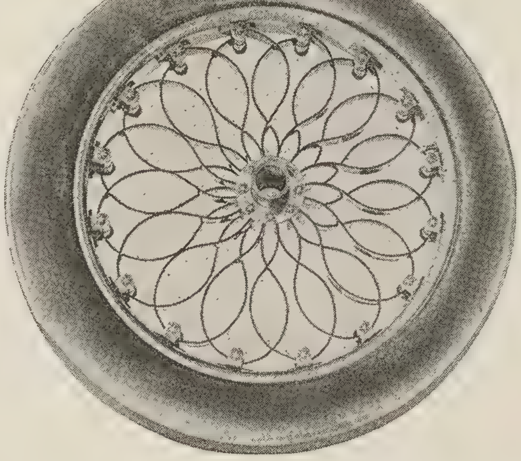
Are daily gaining in favor with manufacturers and pilots of aircraft because:

They Absorb Shocks *They Are Stronger* *They Are More Reliable*



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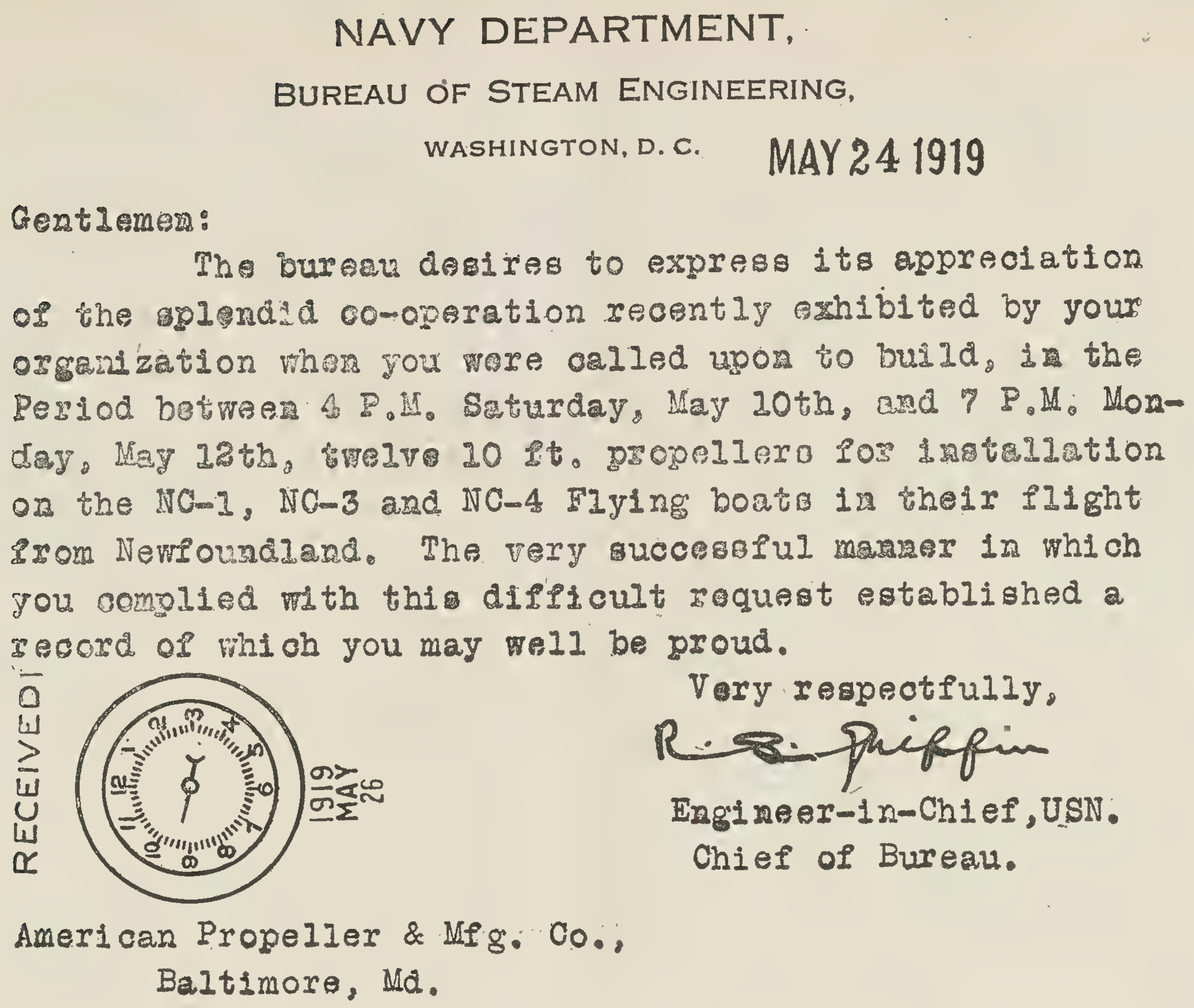


NAVY DEPARTMENT,
BUREAU OF STEAM ENGINEERING,
WASHINGTON, D. C. MAY 24 1919

Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

Very respectfully,

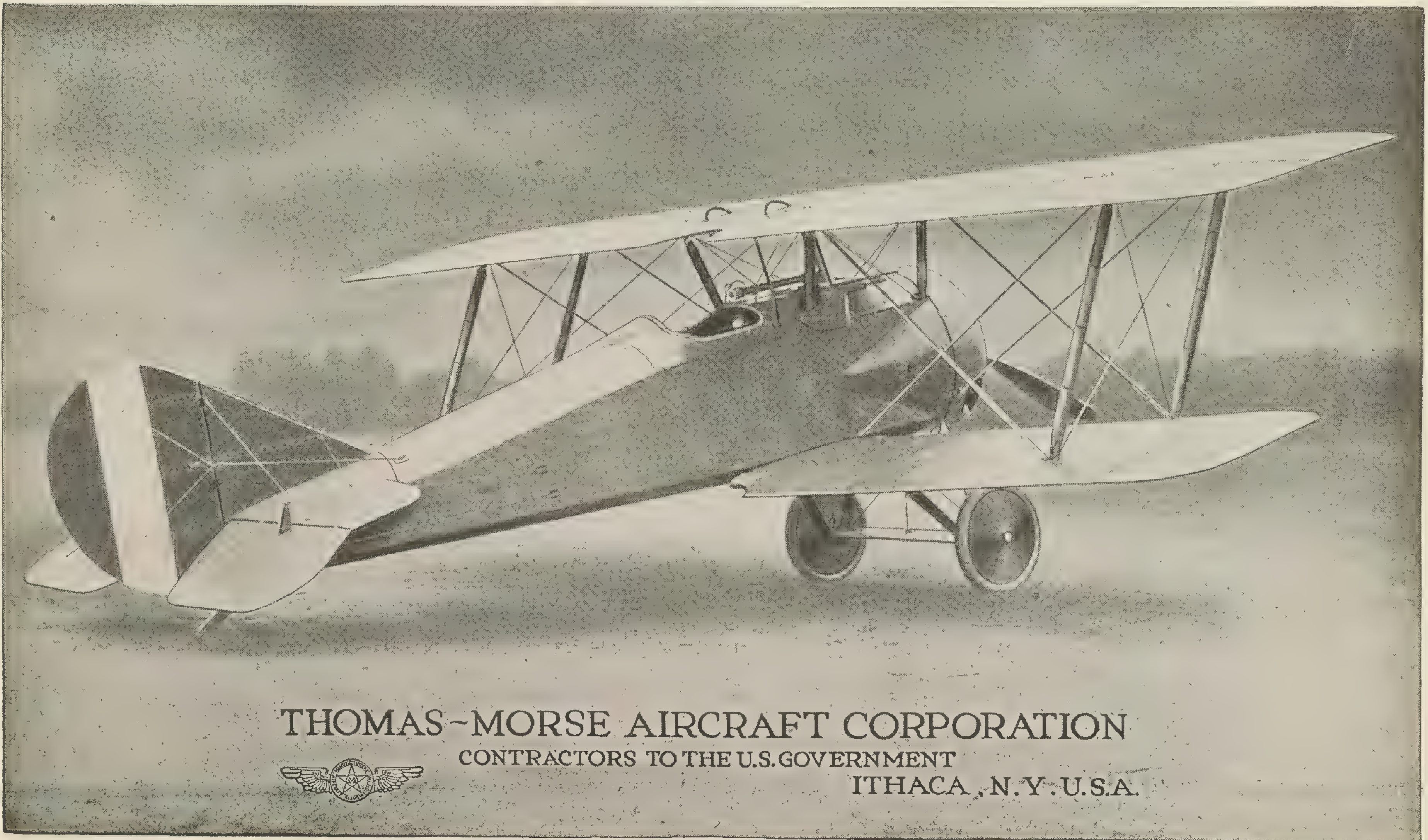
R. S. Griffin

Engineer-in-Chief, USN.
Chief of Bureau.

RECEIVED 1919 MAY 26

American Propeller & Mfg. Co.,
Baltimore, Md.

Thomas



THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
ITHACA, N.Y. U.S.A.

Vought VE-10 Appears

(*Continued from page 7*)

of structural simplicity. It requires fewer parts than other types of trussing because the maximum efficiency is obtained from each member by the double function which the member plays of carrying each kind of stress. This means that the truss, when used in airplane construction, consequently has lower head resistance.

Besides the undisputed advantage of low head resistance the truss, as worked out in the VE-10, has the important additional advantage of production simplicity. Due to high center of thrust, flying-boats usually require the upper wing to have an overhang in order to maintain proper distribution of head resistance, i. e., to keep the center of thrust and center of resistance close together. Ordinarily, the airplane designer obtains this overhang by means of special wing panels and a complicated system of bracing that practically eliminates all possibility of standardization of either the large or small parts. This of course adds greatly to the cost of manufacturing and maintenance.

In the VE-10, by virtue of the inclination of the struts, the overhang is obtained without using special panels or any extra bracing whatever. The upper and lower panels are absolutely identical and the maximum number of duplicate parts is used throughout the construction, thus making a real production job which can be built and maintained in use for a minimum cost.

Any one aileron will fit on any of the four wings, being a standardized design unit. The struts and strut fittings are universal and are interchangeable with other parts used in similar places. They are unique and simple in design. The struts are made of wood, with swaged steel tension rods running through their centers and fastened at each end to the socket fitting, thus holding all strut fittings together. This combination and arrangement of the two materials, as shown by tests, actually gives a lighter member than the all-steel streamline strut generally used in Warren truss construction adaptations abroad and a complete cellule lighter than the strut and wiring system of the Pratt truss. The fittings are mild sheet steel stampings, and very few require to be either brazed or welded or subjected to heating operations.

The single cockpit is carefully and logically arranged, having the comfortable and appointed appearance of the tonneau of a fine motor car. The pilot's seat is forward in the center of the boat, with the passengers' seats in tandem on either side, just to the rear. The pilot and passengers have an abundance of room. The seat cushions are padded with Kapok and covered with black leather. They are easily detached from the seats and are designed to be used as life preservers. Although the hull is only four feet in beam, the cockpit has the appearance of being spacious, since it is economically arranged and has no cumbersome yoke and hand wheel or exposed wires and pulleys.

The VE-10 is controlled by a standard VE-7 stick control which has all of the control wires enclosed in the mechanism. The aileron and elevator controls are practically frictionless and extremely light. The rudder is controlled with the usual foot rudder bar. In straight-away horizontal flight the VE-10 flies itself and the controls may be entirely released.

The engine throttle is operated by a system of rods and bell cranks that insure positive control at all times. No cables, springs or other uncertain acting parts are used in this important mechanism. The present machine is equipped with a hand-starting magneto, but it is announced that the company will equip all machines with electric self-starters if desired.

The VE-10 engine mounting is another big improvement in flying-boat design and construction. The VE-10 has a patented mounting, which consists of only two parts. The engine bearer and struts for each side are integral and made of single sheets of laminated wood, which is cut out for lightening up. No fittings are required between the struts and engine bearers. The mounting rests directly on the top chines of the hull and is fastened to the hull with plate fittings. The mounting is absolutely free of vibration at all motor speeds. The engine may be removed from the bearers by withdrawing only three bolts other than those required to hold the crank-case in place. This is an ideal arrangement, since some flying-boats have to be practically dissembled before the engine can be removed.

Another important feature of the design is that it can be rigged without the possibility of incorrect alignment, and the past month's flight work with the machine indicates that malalignment will not develop in strenuous usage.

The hull has one ventilated step, which is of the "false" type (separate from the bottom proper), and has no side fins. The planing area is obtained by bowing the lower chines out so as to replace the side fins. The hull sides and decks are constructed of single sheets of three-ply veneer and the bottom of triple sheets attached to ash and spruce ribs, the attaching means throughout employing liberal gussets and fillets. The veneer is made in panels three by five feet, of boards cut from the circumference of trees, and is absolutely waterproof.

The VE-10 hull has a Vee from bow to stern which permits it to land with the least amount of pounding. The keel is made of a single piece of oak and is reinforced with a steel bearing strip at the step. The machine taxies beautifully and unquestionably can be handled very easily.

Planes on Tour

Four planes were sent from Hazelhurst Field, Mineola, Saturday, on an up-State excursion which will occupy them for a week. They will give flying exhibitions at Avon and at Albany.

Their immediate destination is Avon, which is the home of Senator James W. Wadsworth. They planned to stop en route at Poughkeepsie, Albany, Utica and Syracuse. After taking part in a celebration at Avon they will return to Albany to share in a homecoming celebration.

The "Bristol" Aeroplanes.

COMMERCIAL—MILITARY—SPORTING

¶ The performance of the "Bristol" Fighter in the world war is historic.

¶ It stood the test of every service requirement and emerged the acknowledged peer of aircraft the world over in its class.

¶ A limited number of these sturdy "Fighters"—brand new—are now offered at an attractive price.

¶ Modified to accommodate one or two passengers with pilot and equipped as a hydro-aeroplane if desired. These machines should prove an excellent investment for any purpose.

¶ Details on request.

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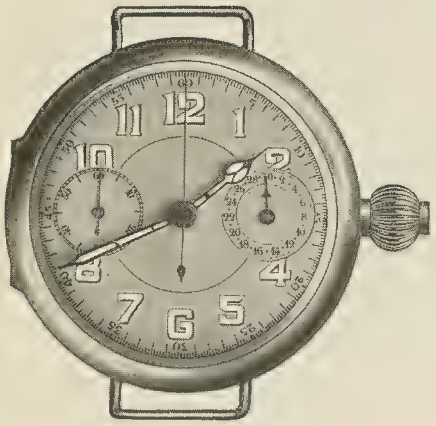
WRIST CHRONOGRAPHS

PLAIN AND LUMINOUS DIALS

ILLUSTRATION SHOWS



No. 123714C.

CHRONOGRAPH ACTUAL SIZE

The only practical "Aviators" split wrist chronograph. 18 jewels. Sterling silver case. Hands and figures treated with a special two year guaranteed radium material passed by U. S. Gov. Furnished with special "Aviators" wrist strap. Suitable for wearing outside of coat sleeve. Price, Net, $60.00

While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

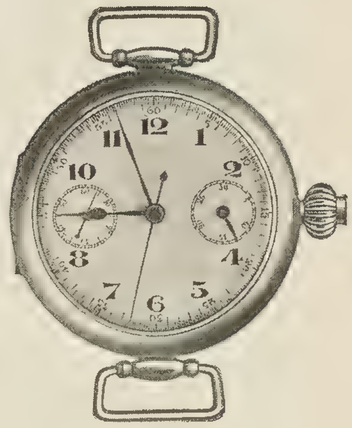
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS



No. 3714C.

CHRONOGRAPH ACTUAL SIZE

Smaller size "Aviators" split wrist chronograph. Furnished with or without radium hands and figures. Guaranteed two years. 18 jewels. Adjusted to heat, cold, ichronism and thoroughly reliable. Sterling silver case. Furnished with web strap, sterling silver buckle. Price, Net, $60.00

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NEW YORK,
473 Kent Avenue, Brooklyn

Peace Treaty Convention

(*Continued from page* 8)

the two aircraft shall make the overtaking aircraft a crossing aircraft within the meaning of these rules, or relieve it of the duty of keeping clear of the overtaken aircraft until it is finally past and clear.

As by day the overtaking aircraft cannot always know with certainty whether it is forward or abaft the direction mentioned above from the other aircraft, it should, if in doubt, assume that it is an overtaking aircraft and keep out of the way.

29. Where by any of these rules one of the two aircraft is to keep out of the way, the other shall keep its course and speed. When, in consequence of thick weather or other causes, the aircraft having the right of way finds itself so close that collision cannot be avoided by the action of the giving-way aircraft alone, it shall take such action as will best aid to avert collision.

30. Every aircraft which is directed by these rules to keep out of the way of another aircraft shall, if the circumstances of the case admit, avoid crossing ahead of the other.

31. In following an officially recognized air route every aircraft, when it is safe and practicable, shall keep to the right side of such route.

32. All aircraft on land or sea about to ascend shall not attempt to "take off" until there is no risk of collision with alighting aircraft.

33. Every aircraft in a cloud, fog, mist or other conditions of bad visibility shall proceed with caution, having careful regard to the existing circumstances and conditions.

34. In obeying and construing these rules due regard shall be had to all dangers of navigation and collision and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

IV

BALLAST

35. The dropping of ballast other than fine sand or water from aircraft in the air is prohibited.

RULES FOR AIR TRAFFIC ON AND IN THE VICINITY OF AERDROMES

36. At every aerodrome there shall be a flag hoisted in a prominent position which shall indicate that if an aircraft about to land or leave finds it necessary to make a circuit, or partial circuit, such circuit shall be left-handed (anti-clockwise) or right-handed (clockwise), according to the color of the flag. A white flag shall indicate a right-handed circuit—*i. e.*, that the flag is kept to the right side or side which carries the green light of the aircraft, and a red flag shall indicate a left-handed circuit—*i. e.*, that the red flag is kept to the left side or side which carries the red light of the aircraft.

37. When an aeroplane starts from an aerodrome it shall not turn until 500 metres distance from the nearest point of the aerodrome, and the turning then must conform with the regulations provided in the preceding paragraph.

38. All aeroplanes flying between 500 and 1,000 metres distance from the nearest point of an aerodrome shall conform to the above mentioned circuit law, unless such aeroplanes are flying at a greater height than 2,000 metres.

39. Acrobatic landings are prohibited at aerodromes of contracting States used for international aerial traffic. Aircraft are prohibited from engaging in aerial acrobatics within a distance of at least 2000 metres from the nearest point of such aerodromes.

40. At every recognized aerodrome the direction of the wind shall be clearly indicated by one or more of the recognized methods—*e. g.*, landing tee, conical streamer, smudge fire, etc.

41. Every aeroplane when taking off or alighting on a recognized aerodrome used for international air traffic shall do so up-wind, except when the natural conditions of the aerodrome do not permit.

42. In the case of aeroplanes approaching aerodromes for the purpose of landing, the aeroplanes flying at the greater height shall be responsible for avoiding the aeroplane at the lower height, and shall as regards landing observe the rules of paragraph 28 for passing.

43. Aeroplanes showing signals of distress shall be given free way in attempting to make a landing on an aerodrome.

44. Every aerodrome shall be considered to consist of three zones when looking up-wind. The right-hand zone shall be the taking-off zone, and the left-hand shall be the landing zone. Between these there shall be a neutral zone. An aeroplane when landing should attempt to land as near as possible to the neutral zone, but in any case on the left of any aeroplanes which have already landed. After slowing up or coming to a stop at the end of its landing run, an aeroplane will immediately taxi into the neutral zone. Similarly an aeroplane when taking off shall keep as far as possible toward the right of the taking-off zone, but shall keep clear to the left of any aeroplanes which are taking off or about to take off.

45. No aeroplane shall commence to take off until the preceding aeroplane is clear of the aerodrome.

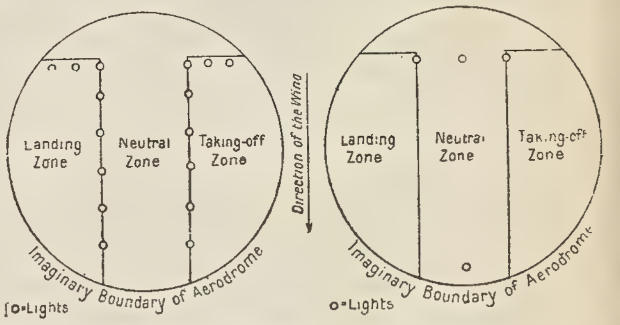
46. The above rules shall apply equally to night landings on aerodrome, when the signals shall be as follows:

(*a.*) A red light shall indicate a left-hand circuit, and a green light shall indicate a right-hand circuit. (See paragraph 36). The right-hand zone will be marked by white lights placed in the position of an "L," and the left-hand zone will be similarly marked. The "L's" shall be back to back, that is to say, the long sides of the "L's" will indicate the borders of the neutral zone, the direction of landing shall invariably be along the long arm of the "L," and toward the short arm. The lights of the "L's" should be so placed that the lights indicating the top extremity of the long arm shall be the nearest point on the aerodrome upon which an aeroplane can safely touch ground. The lights indicating the short arm of the "L" should indicate the limit of safe landing ground for the aeroplanes, that is, that the aeroplane should not overrun the short arm. (See diagram A.)

(*b.*) Where it is desired to save lights and personnel the following system may be used:

Two lights shall be placed on the windward side of the aerodrome to mark the limits of the neutral zone mentioned in paragraph 44, the line joining the lights being at right angles to the direction of the wind. Two more lights shall be placed as follows: One on the leeward side of the aerodrome on the line drawn parallel to the direction of the wind and passing midway between the two lights on the windward side, show the extent of the aerodrome and the direction of the wind, and the other shall be placed midway between the two lights marking the limits of the neutral zone. (See diagram B.)

Additional lights may be symmetrically put along the boundary lines of the neutral zone, and on the ends of the taking-off and landing zones on the line through the three lights on the windward side.



47. No fixed ballon, kite, or moored airship shall be elevated in the vicinity of any aerodrome without a special authorization, except in the cases provided for in paragraph 20.

48. Suitable markings shall be placed on all fixed obstacles dangerous to flying within a zone of 500 metres of all aerodromes.

(*To be Continued*)

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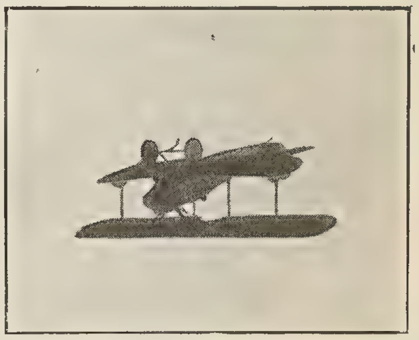

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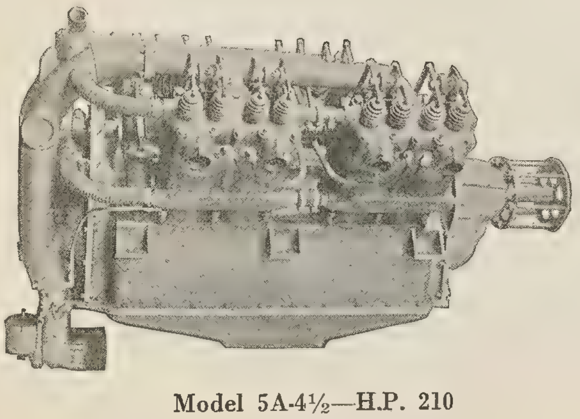

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(4) All planes used in the **LONDON-PARIS COURIER AIR SERVICE,** instituted by the British Government to carry Ministers, Officials and Despatches to and from the PEACE CONFERENCE, were fitted with **ROLLS-ROYCE Engines**

(5) The only machine to fly over London with 40 passengers. Handley-Page with **ROLLS-ROYCE Engines**

(6) In practically every successful long-distance bombing raid into Germany carried out by the **BRITISH ROYAL AIR FORCE,** planes were used, fitted with **ROLLS-ROYCE Engines**

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THE BEST IN THE WORLD

ROLLS-ROYCE

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First Division Returns

(*Continued from page* 3)

border, was the first American Aero Squadron over the line with American troops, and was with the First Division, which was the first division over and the last to return.

Here the squadron carried out the usual reconnaissance work and assisted in locating the lines. Several times the pilots, by reporting the Germans massing for counter attacks, enabled the artillery to concentrate on these and thereby break up the pending attack. This squadron was with the troops a great portion of the time they were in the lines, watching over them and attempting to keep them out of difficulty, such as would be experienced in the case of a surprise attack or a hidden concentration of machine-gun nests. It was in connection with this work that a lieutenant was sent out on a special mission to locate the possibility of a counter-attack on the part of the enemy. By flying very low he was enabled to distinguish and identify concentration movements and locate them. While on this mission he was shot and dangerously wounded, yet secured the information and returned to headquarters. The artillery was enabled to concentrate on the points identified and thereby prevented the counter attack and dispersed the movement.

The cooperation with other arms and its extreme importance was now realized. Only the heaviest rain and fog stopped the visual reconnaissannce and they kept the corps and divisional staffs constantly informed of enemy movements. Cigarettes and newspapers were carried and dropped over the lines daily for the benefit and comfort of our troops.

Tons of bombs were dropped from airplanes behind the enemy lines, creating much confusion and damaging rail lines, stocks of supplies, buildings and concentration centers. Machine gun nests were located and destroyed by direct fire from our planes.

The excellent work of the squadrons was noted and commented on. The following letter was written on September 28, 1918, by the Chief of Staff, First Army Corps, to the Chief of Air Service, First Army Corps:

> 1. I am directed by the Corps Commander to inform you that he is exceedingly gratified at the work of the Corps Observation Squadrons which during the present offensive has been up to their usual high standard.
>
> 2. There is no particular way of communicating a matter of this sort to the individuals of the groups except through you and you are requested to inform them.
>
> 3. The Corps Commander desires that every man who in his own sphere does his part well should be included in his communication, as those who handle transportation as well as the mechanics, repair men and such, are just as important as any other link in the chain.
>
> 4. It is thoroughly understood that your men are subject to discouragement now and then through inability to connect up with an infantry line and to verify a P. C. and similar missions. In cases of this sort it must be remembered that facility in communicating with their planes and answering their signals has not yet been absorbed by all our units.
>
> 5. In spite of the foregoing all missions have been accomplished to the satisfaction of those at these headquarters in general and to the Corps Commander in particular.
>
> (Signed) MALIN CRAIG, *Chief of Staff.*

The report of the Liaison Officer with the First Division states, "On the first day of operations with this division in the Meuse-Argonne sector we lost nine machines trying to find the front lines. We were operating with only about one-third strength. This squadron suffered 80 per cent casualties by trying to work in impossible weather."

SALE OF NAVY FLYING BOATS, SEAPLANES, AERONAUTICAL ENGINES, SPARES

There will be offered for sale by sealed proposals to be opened at Bureau of Supplies and Accounts, Navy Department, Washington, D. C., at 2 P. M., September 22, 1919, a large assortment of Surplus, Heavier-than-Air Equipment. Most of this equipment is new and in excellent condition; many planes have never been uncrated.

The sale will include the following:

83	Flying Boats, HS-2-L, with 330 hp. Liberty Engine.
52	Flying Boats, H-16, with 2 330 hp. Liberty Engines.
20	Flying Boats, F-5-L, with 2 330 hp. Liberty Engines.
50	Seaplanes, Aeromarine Model 39-B with Curtiss 100 hp. Engine.
10	Flying Boats, Aero Model 40, with Engines.
2	Curtiss (GS-4) Gnome Speed Scouts.
1	Boeing Seaplane with Engine.
1	Seaplane, Aeromarine, Type 39A, without Engine.
250	Curtiss OXX-6 Engines, 100 hp. each, New.
50	Curtiss OXX-6 Engines, 100 hp. each, Used.
13	Curtiss OX-2 Engines, 90 hp. each, Used.
3	Curtiss OX-5 Engines, 90 hp. each, Used.
13	Curtiss OXX-3 Engines, 100 hp. each, Used.
51	Hispano Suiza Engines, 220 hp. each, Foreign Built.
20	Hall Scott Engines, Used.
32	Gnome Engines, 100 hp. each, New and Used.
9	Salmson Hydro-Glycier Engines, 220 hp. each, Used.
	Sets of Spare Parts.
	Handling Trucks.

The above materials are stored at the Fleet Supply Base, South Brooklyn, N. Y., Naval Aircraft Factory, Philadelphia, Pa., Naval Aircraft Storehouse, Gloucester, N. J., and Naval Air Station, Hampton Roads, Va.

Inspection is invited and may be arranged for with the Supply Officers of the above Naval Stations. Schedules of sale giving full description and complete data together with form for proposal is obtainable from above officers or at Salvage Section, Bureau of Supplies and Accounts, Navy Department, Washington, D. C., JOSEPHUS DANIELS, Secretary of the Navy.

8-29-19.

Proposals for Airplane Design and Construction.—Office of Contracting Officer, Eng. Div., A. S., McCook Field, Dayton, O.—Sealed proposals will be received here until 10 A.M., Oct. 15, 1919, and then opened, for furnishing certain types of experimental airplanes, designed and constructed by successful bidders. Further information on application.

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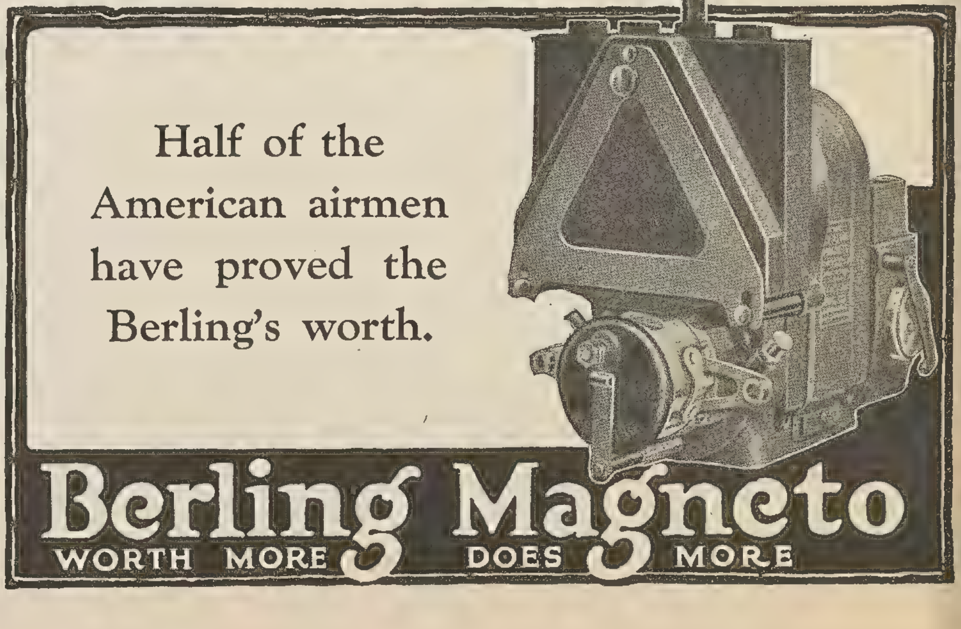

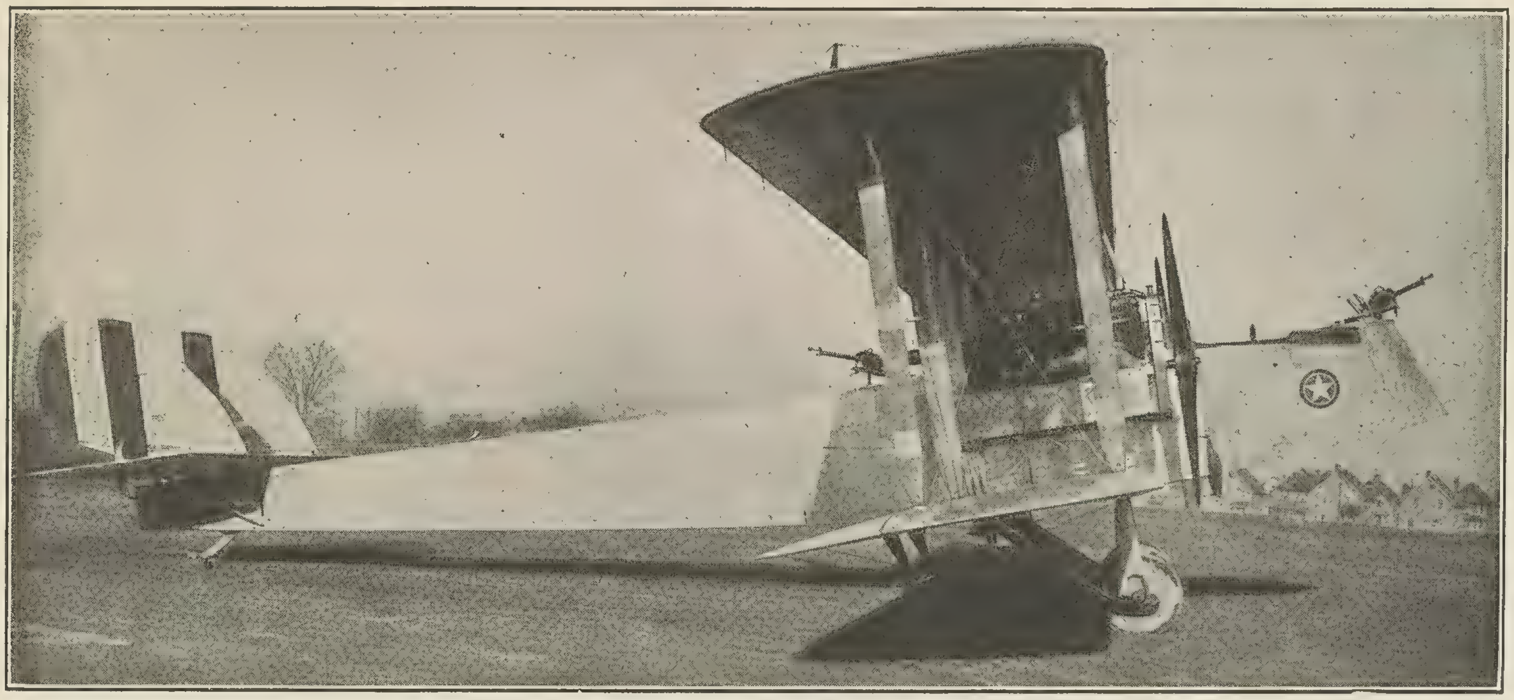

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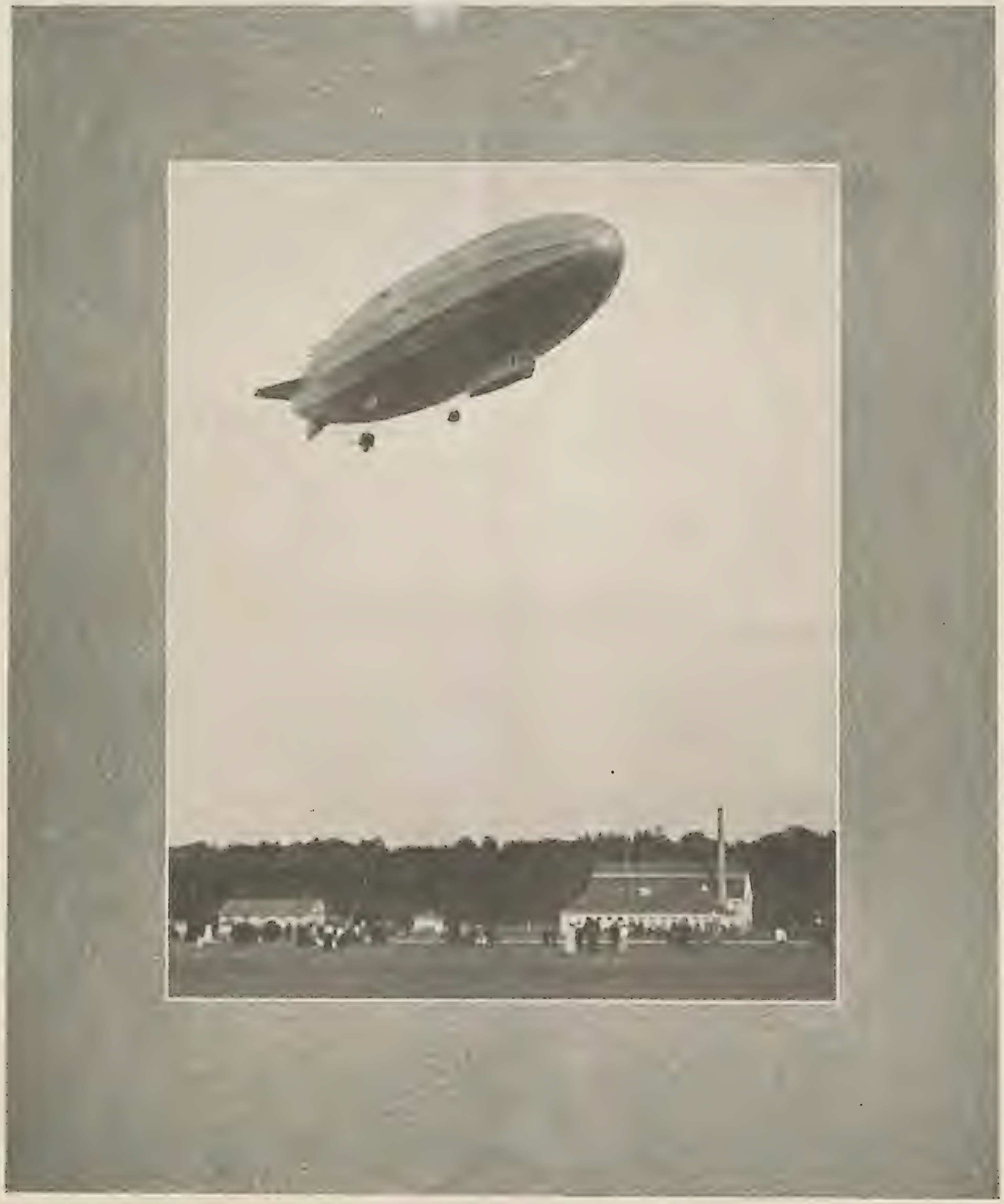
V #12

AIRCRAFT JOURNAL

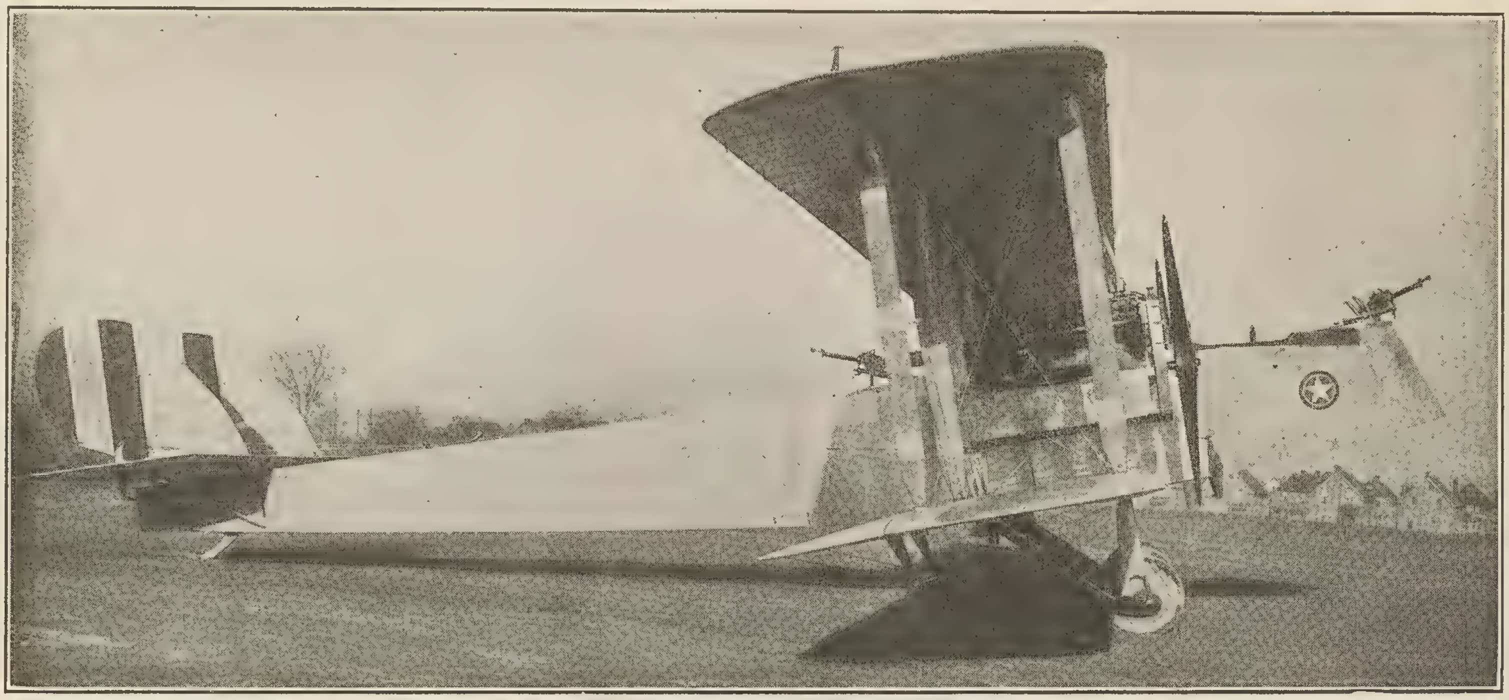
September 20, 1919 *Every Saturday* *Price Ten Cents*



International Film Service

What Germany Has Accomplished Since the Armistice

—The "Bodensee"



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The Independent Air Department

Authoritative Statement of Arguments For and Against Herewith Presented

An authoritative statement of the arguments for and against a separate Department of Aeronautics has been difficult to secure, as officers have felt that their opinions should be given before the Congressional committees which are considering the subject. The *U. S. Air Service* has collected the pros and cons on the subject and they give in condensed form the two points of view.

For a Separate Air Service

That the proper development of the Army Air Service is stifled by the control of the General Staff of the Army, composed of Cavalry, Artillery and Infantry officers who have not complete confidence in the Air Service (Senator Chamberlain). That the strategical and tactical necessity is obvious of having final authority invested in those who are interested in and operate an Air Force as such.

The *raison d'être* of an Air Force in time of peace is not liaison with other arms, but defense of the country and inherent development of the Air Service. Furthermore, as regards liaison, the Independent Air Service Bill provides for the detail and tactical control of such Air Service units as must necessarily, from the nature of things, be annexed to the Fleet or to the Army. The Air Service fully recognizes the necessity of the Secretary of Air attaching several observation and pursuit units as required, to both the Army and the Navy, to be, while so attached, absolutely under the Army or Navy Commander (Brigadier-General Mitchell, Director of Military Aëronautics). That there should be no more difficulty in diverting a portion of the Air Force to co-operate with the Army than there is difficulty in detailing a unit of Marines to such duty. But other measures, such as bombarding the enemy's men-of-war bases or supply bases of any kind, can be carried out only by the side having a superior Air Force, and that to gain such superiority, concentration is vital.

That huge expenditures are duplicated because of lack of central control and that therefore all estimates for expenditures should go to one Committee which should handle the aërial needs of the Army, the Navy, the Post Office Department, Land Department, Treasury Department and all Government Agencies which have need of airplanes. The history of the recent war proved the folly of allowing this to be handled by the Quartermaster and the Navy Bureau of Supply.

That many of those who oppose a separate Air Service, both in the Army and in the Navy, do so for selfish reasons and without regard to the interest of aëronautics in its broader sense (Senator New). That the attitude of such persons and officials is to be discounted in advance. That the vast majority of those Army officers, past and present, who are disinterested champions of aërial efficiency—namely, fliers—favor a separate Air Service, and that the Navy Air Service is becoming converted to this view.

That both England and France, with experience bred of war, have been forced to adopt an independent Air Service. That there is nothing in the facts to show that it has been unsuccessful—on the contrary, England has appropriated $330,000,000 to place it on the same footing as the Navy. (Report of Mission headed by Assistant Secretary of War Crowell.)

That an independent Air Service will prevent stultification of a necessary commercial industry and will lend encouragement where encouragement is vitally necessary.

That an Independent Air Force looks towards the best interests of America's aërial development, which is far behind that of England and France.

Against a Separate Air Service

That the High Command of the Army should have power to use the Air Service for such purposes and at such times as it sees fit in connection with the Army as a whole. That decentralization of control will lessen efficiency.

That the *raison d'être* of an Air Force is liaison with other branches; *i.e.,* in the Army, reconnaissance and contact patrol with the Infantry and fire control with the Artillery; in the Navy, reconnaissance for the Fleet and the work of "spotting" big gun fire; and that such co-operative work will be hampered by a separate Air Force. That difficulties will arise in regard to preliminary training for fliers, for example: That Navy fliers—who receive their early training in the Navy in order that they may think along Navy lines; and that Army fliers—who are to co-operate with the Infantry and Artillery—must receive their early training in the Army in order that they may think along their highly specialized lines.

That the Procurement Division of the Army Quartermaster Department is competent to purchase and contract for all the aircraft that the Army needs in peace-time. That the well-organized Navy Bureau of Supplies and Accounts is qualified to contract and purchase for the Navy Air Service.

That the majority of the Navy Air Service is opposed to an independent Air Service controlling both the Army and the Navy, and that presumably the Heads of Departments, which at present control the various Air activities, will be found adverse to the proposition to have all Air activities co-ordinated under one Bureau. (Statement to press of Chief of Staff.)

That the Independent Air Service in Great Britain has not been particularly successful.

That centralized aërial activities in one Government Department will not tend to encourage manufacturing industries.

That the Air Service should remain, as it is, subsidiary to other Branches of the Military Establishment and that it is not justified in asking for independent existence.

Pilots Honor Pershing

In a dense fog, twelve pilots started from Hazelhurst Field, Long Island, "Pershing Day" to fly over New York in tribute to the commander-in-chief and the officers and men of the First Division as they paraded down Fifth avenue.

The fliers were in bombing formation, De Haviland planes leading a number of Curtiss machines.

The pilots were: Major Henry J. F. Miller, Capt. T. W. Allen, Lieut. H. B. Mandelman, Capt. Gordon Reel, Capt. A. E. Simonin, Capt. Field Kindley, Major Henry J. F. Miller, Lieut. H. B. Norris, Lieut. Kenneth Garrett, Lieut. F. Kirby, Lieut. W. E. Richard and Lieut. F. W. Torney.

Each of the fliers carried a passenger and Lieutenant Torney had in his machine a photographic outfit and an operator, with which pictures of the parade were to be made.

The R-33 on Flight

The R-33, sister ship of the R-34, completed a twenty-four hour journey during last week, starting from the aerodrome at Pelham, Norfolk, flying over Amsterdam, Rotterdam, and Antwerp, and then following the course of the old battlefront to the southwest. Aboard the craft were ten financiers in addition to the officers and crew. The chef and head waiter of a prominent London restaurant were also on board.

One report stated that the primary object of the trip is to survey in detail the canals of Holland, but it is declared officially that there is nothing to be done except to advertise the aggressive policy of Great Britain in civil aviation.

The most elaborate arrangements were made for the accommodation of passengers, beds being fitted up complete, with blankets, sheets, mattresses and pillows, all of which could be stored out of the way during the day. Breakfast was cooked on a small electric stove and consisted of eggs and bacon, hot tea or coffee and toast. For luncheon there was arranged a menu of cold lobster, roast partridge, hot potatoes and French beans, and iced pudding, and for dinner the government's guests were to have hot soup, followed by salmon trout, roast lamb, potatoes and French beans, jam omelette and coffee.

The chef, before boarding the R-33, said he regretted the limitations of the menu, but he was quite sure of being able to serve a souffle or making any alteration in the menu that he desired, as he had taken with him an extra supply of eggs. As on the R-34 the cooking was partly done on the exhaust pipes.

Invitations to make the voyage had been extended to one leading member of industry and representatives of the Home and Colonial Government Departments interested in the common development of this type of aircraft. On board also was Lieutenant de Vaisseu Sable, air attaché of the French Embassy in London, and Air Commodore E. M. Maitland. The crew numbered twenty-seven.

Seaplanes for Warships

Every American warship of the first and second class is to be equipped with a seaplane, according to a report from the Navy Department. This is to even up with the progress already made by Great Britain.

This policy, with the co-relative one of building a great fleet of dirigibles, is directly in line with the vews of the naval war experts as to defense "in the next war."

They say the time has passed when a direct attack on sea coast cities like New York or Boston may be made by a battleship fleet, however powerful. The attack will be by seaplanes, launched from a moving base of dreadnoughts at sea, Navy officers assert. Hence the plan, now announced, of converting land planes into working seaplanes to be assigned to each of the larger ships of the American Navy.

It was announced several weeks ago that all the British battleships and cruisers had been fitted with seaplanes, and, in this respect, the English navy would be superior, ship for ship, to any other. Now the United States is catching up, without having to wait for the special construction necessary to English ships, which are provided with elaborate runways.

This manner of adding to the efficiency of warships was not regarded as important by Germans. The war showed that Germany devoted her time and resources to the construction of rigid dirigibles as an offset to the superior navies of Great Britain and the United States.

Circles Paris

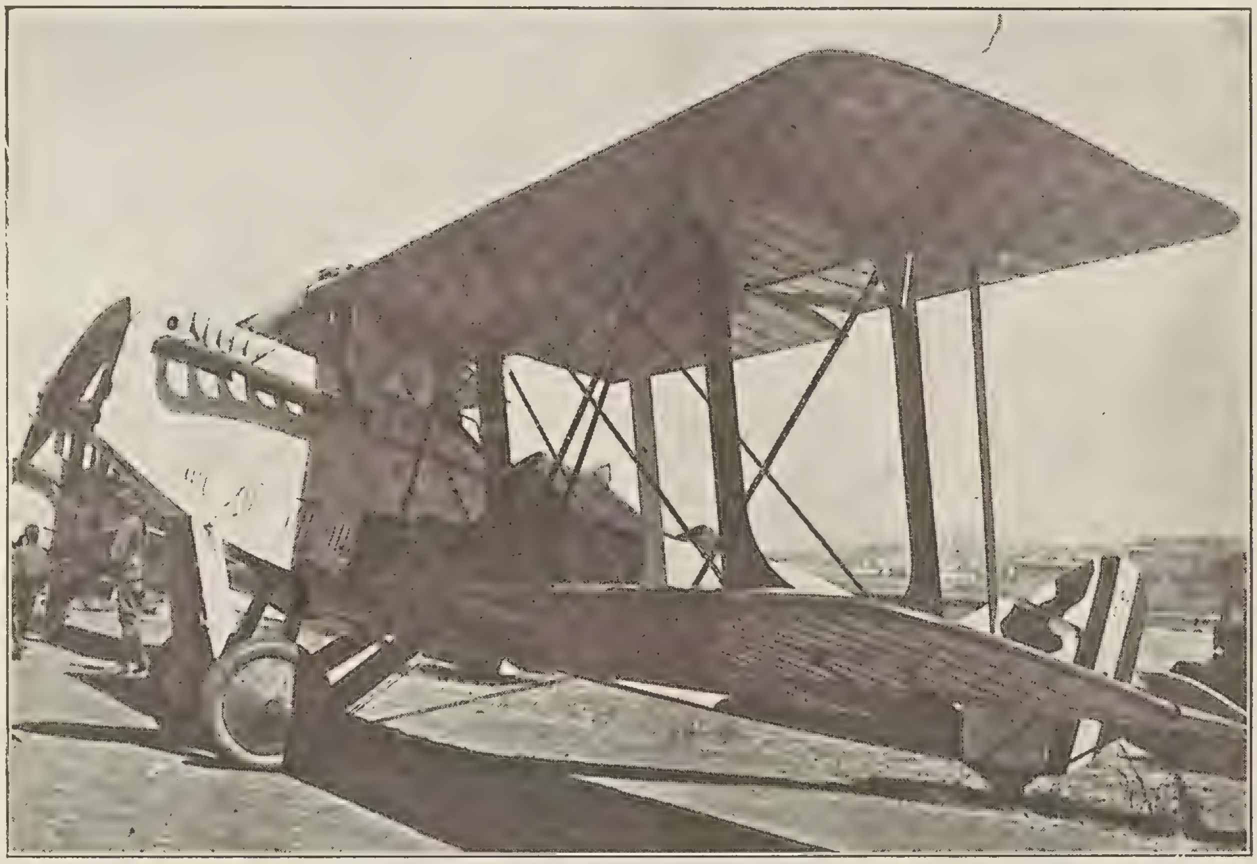
The French airman Sadi Lecointe won the cup donated by Henry Deutsch de la Meurthe, president of the Aero Club of France, by flying around Paris on Tuesday last by way of St. Germain, Senlis, Meaux and Melun, a distance of 200 kilometres (124 miles) in 48 min. 8 sec. Lecointe made an average speed of 240 kilometres 307 metres an hour.

World's Altitude Record Granted to Major Schroeder

Supercharger Enables Le Pere Biplane to Reach Height of 28,500 Feet, a New Record for Pilot and One Passenger

A new official world's altitude record for pilot and one passenger was made at Dayton, O., Sept. 6, when Major Rudolph W. Schroeder climbed to 28,500 feet in a LePere biplane equipped with a 400 hp. Liberty, according to an announcement from the American Flying Club. The announcement followed the receipt and homologation of data and barograph charts sent by Col. Thurman H. Bane, chief of the Army airplane engineering division at McCook Field, Dayton. The certified Army reports were forwarded to the club for examination, and when found acceptable, the record was granted to Major Schroeder.

This new mark of 28,500 feet greatly surpasses the former two-man altitude record held by Captain Lang of the Royal Air Force, who ascended to 27,300 feet on January 2, 1919, in a 375 hp. English biplane. No official figures have been received in this country as yet in regard to the reported altitude climb of Adjutant Casale, who, with one passenger, according to unofficial reports, broke previous records last June. Until official proof of this flight is received, Major Schroeder's record will stand as the world's record for a pilot flying with one passenger.



LEPERE PLANE, TYPE FLOWN BY MAJOR SCHROEDER
Photo International Film Service

The recent one-man flight of Roland Rohlfs over Long Island, when he was reported to have made a height of 31,000 feet, has also been made official, according to Aero Club of America officials.

Major Schroeder's new world's record is of international interest because it was made possible by the new airplane engine super-charger, originated during the war but never perfected until recently, and which practically doubles the efficiency of an airplane engine at high altitudes.

"In the future," said Chance M. Vought, chairman of the American Flying Club Contest Committee, "airplanes equipped with these super-compressors will be able to attain heights hitherto regarded as impracticable—levels at which are found constant trade winds. These winds at various extreme levels can be found following courses suitable to almost any international trade route and can thus be utilized to tremendous advantage in aerial commerce. The airplanes equipped with this super-charger device will fly at greater air speeds at altitudes than are now possible and will have almost the same performance of speed and climbing power as at around sea level. Among the technical experts this invention is called 'a constant power' device."

The LePere biplane, equipped with Liberty motor, which Major Schroeder used in the altitude flight, has a horizontal speed at sea level of 136 miles an hour. At an altitude of more than 20,000 feet, this speed, owing to the rarity of the atmosphere and the decreased engine power, falls to 105 miles an hour. Equipped with the super-charger device, the horizontal speed at 28,250 feet was maintained at over 130 miles, or almost equal to the best possible at sea level. Major Schroeder found that the compressor consumed but 5 or 10 per cent of the engine's horsepower, while at 15,000 feet altitude it added 40 per cent to the power-plant's effectiveness; at 20,000 feet, 48 per cent was added, and at 28,000 feet, 60 per cent was gained. The super-compressor, simply described, is a device to utilize the waste exhaust gases of the engine itself to operate a small centrifugal air-blower which forces a combustible air stream into the engine at a constant pressure about equal to the normal suction of the motor at sea level pressure, and thus maintains engine functioning approximately the same as under the best conditions at sea level.

Major Schroeder and his passenger wore electrically-heated clothing and oxygen helmets. The record shows that the temperature at 28,250 feet was minus 29 degrees centigrade. Major Schroeder is possibly the best know test pilot in Army aviation. In addition to his new record he also is the holder of the official one-man altitude record at 28,900 feet, made with a Bristol biplane equipped with a Hispano-Suiza motor, at Wilbur Wright Field, Sept. 18, 1918. His two-man altitude flight is preliminary, it is understood, to a new attempt at the one-man height record with a machine equipped with the super-compressor. Major Schroeder's flight log indicated that he could have attained several thousand feet more altitude on his record attempt, but he reported that as this was the initial flight test of the newly developed constant power device, and having sufficiently broken the existing record, he decided to come down and let the experts inspect the invention and make a report on its condition. He will make his next trial within a week at Dayton.

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In Michigan

William M. Blair, manager of the Thompson Airplane Co. of Detroit, Mich., distributors of Curtiss airplanes and flying boats for Michigan and part of Ohio, is of the opinion that Michigan, with its many miles of lake front and its numerous good harbors, promises to be a gathering place for flying boat owners. Mr. Blair is shortly to fly a Curtiss Sea Gull from Chicago to Detroit, following the coast of the lower peninsula of Michigan and making stops at all of the principal cities. The trip will give Mr. Blair a chance to demonstrate the practicability of the flying boat.

Mr. Blair was a lieutenant in the Navy Air Service during the war, and saw service abroad with both American and British squadrons. He was for a time attached to the famous Northern Bombing Group operating on the Belgian coast. He is a Chicagoan and graduated from Cornell with the class of 1917.

Soon after the United States got into the war Mr. Blair organized the Great Lakes Naval Training Station Flying Unit, a body made possible through the support of patriotic Chicago men.

Another former service aviator now with the Thompson Airplane Co. is C. C. Robinson, who was a captain in the Royal Canadian Air Service. Mr. Robinson has been operating a "taxi" service for the company at Morrow Field, Detroit.

Jersey Town's Station

The City Commission of New Brunswick, N. J., has voted to construct an airplane landing field on a large field on the City Farm. Gasoline stations and a hangar will be constructed.

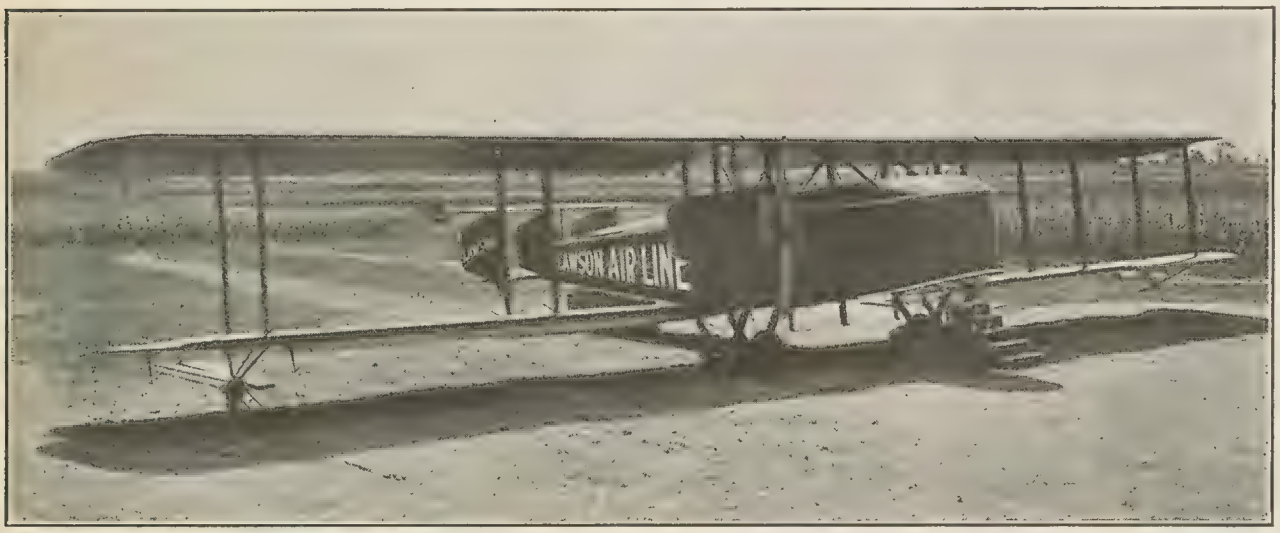
Buy New Curtiss

Barnard Brothers of Spokane have purchased one of the newer types of Liberty-Curtiss planes at Mather Field, California, and are shipping the machine to Spokane for commercial flying.

Lawson Air Liner Arrives in New York

Huge Biplane Makes Flight from Milwaukee in Easy Stages and Will Proceed on Transcontinental Flight to the Coast

The Lawson Air Liner arrived in New York last Saturday after a flight in easy stages from Milwaukee. From the metropolis the big plane will fly to the Pacific Coast, stopping at many places on the way, the general route following Washington, Dayton, St. Louis, Omaha and Salt Lake City. The flight to New York included stops at Chicago, Toledo, Cleveland, Buffalo, and Syracuse.



The Lawson Air Liner Which Flew From Milwaukee to New York

The plane left Syracuse on its last leg Saturday morning with ten persons aboard, including Mr. Lawson. The weather was perfect and the machine flew at the rate of 111 miles an hour, reaching New York after two hours and forty-seven minutes.

From his experience thus far in flying from Milwaukee to New York, Mr. Lawson said that the transcontinental flight will soon be accomplished in thirty-six hours, using parlor car planes for day flight and sleepers for the night runs.

With Mr. Lawson as alternate pilot was his chief assistant, Charles Cox. The engineer was Vincent Buranelli and the mechanics Carl Schorney and Andrew Suini.

In addition to the crew four passengers were carried on the flight from Syracuse. They were Mr. and Mrs. Walter Carrier, of Syracuse; John Cullum, of the Syracuse Journal, and Miss Anna B. Towse, representing the Syracuse Post-Standard.

A letter which Mr. Lawson brought from Governor Emanuel Phillips, of Wisconsin, to Governor Smith, of New York. was delivered to the latter at Syracuse. Governor Smith said he was going to be in New York early next week and he would give the Lawson party an official welcome there.

Mr. Lawson said that he expects to have as passengers eleven United States Senators, on his way to Washington.

The purpose of the flight from Milwaukee to New York and New York to San Francisco, Mr. Lawson said, is to demonstrate the commercial value of airplanes.

On the way down, Mr. Lawson's passengers played bridge, interrupting from time to time to observe the cloudscapes, visible through the windows of their cabin fuselage. The distance traveled was estimated at 313 miles.

The passengers sat in wicker chairs, were protected from the rush of wind created on their trip by celluloid windows smoked to guard against the sun glare in the upper levels, and occasionally rose and walked up and down the aisle to stretch their legs. Forward in the pilots' seats sat Alfred W. Lawson, head of the Lawson Air Line, and Charles Cox, assistant pilot. They had dual controls for governing the craft, so that when either got tired the other could run the ship alone.

The Lawson plane looked in perfect trim, powerful and comfortable, when it landed at Mineola. Its red wings and green body make it a noticeable object in any portion of land or sky it chances to occupy. Along its side is painted in unmistakable letters of white "Lawson Air Line." Its owner says it can be seen thirty miles away with glasses and reasonable visibility.

The Lawson is the first multi-motored passenger-carrying plane with inclosed cabin to attempt a cross-country flight in the United States. According to the prospectus of Mr. Lawson, it is the pioneer of a transcontinental passenger line whose terminals will be New York and San Francisco.

The Cabin of the Lawson Air Liner
(c) *International Film Service*

The plane he has brought to Mineola has a span of 95 feet for both wings. Its overall length is 50 feet and its height 14 feet. Other dimensions are as follows:

Chord, 10½ feet; gap 9 feet, 3 inches; area of wings, including ailerons, 1,700 square feet; area of four ailerons, 168.5 feet; area of stabilizer, 172.5 feet; area of elevators, 57.5 feet; rudder area, 52 feet; weight, loaded, 12,000 pounds.

It is powered by two Liberty motors. Mr. Lawson estimates that it can climb, loaded, 4,000 feet in ten minutes, and gives its ceiling—possible altitude—as 15,000 feet. A gliding angle of eight to one is claimed. Its fuel capacity gives a radius of five hours flying at 100 miles an hour. It left Syracuse with 300 gallons of gasoline and twenty gallons of oil, and had half the gas left when it landed.

The possibilities of flying across the continent in an airplane, Mr. Lawson expects to demonstrate by building a fleet of large passenger carrying planes which will make only one or two stops between the Atlantic and Pacific Coasts. The entire plan rests on the sale of stock of the present company.

Splitdorf Service

The first aerial repair service foı airplanes was inaugurated during the New York-Toronto Aerial Derby when C. S. Jones, Curtiss pilot, accompanied by a service expert for the Splitdorf Magneto Co., preceded the race entrants in a Curtiss JN and established service stations at Albany, Utica and Syracuse, three of the control points on the route.

Extra magnetos were carried in the plane so as to enable the pilots to get immediate assistance should they require it.

The Commercial Plane

Citing several notable examples during recent months of the practicability and safety of the airplane in facilitating small, essential shipments and speeding the busy executive to distant points, J. Horace Lytle, in the September *Metropolitan*, makes out an excellent case for present-day air transportation and its rapid development along conservative lines.

Mr. Lytle cites the views of an executive of a large middle Western airplane manufacturer who a year ago looked upon the airplane merely as a war munition product, but who is now developing a genuine commercial type of moderate air and low landing speed with a new engine said to embody a great advance in reliability and economy of small airplane power plants.

The views expressed in this article are undoubtedly a reflection of the Dayton air spirit which embodies the history and development of heavier-than-air craft from the Wright Brothers to quantity war production of thirty complete day-bombing-observation machines per day. Mr. Lytle's close touch with the leading business interests of Dayton in an advertising capacity gives to his article an authority and educational value frequently lacking in aviation articles in the popular publications.

Peace Treaty Convention Relating to Aeronautics

Annexes D and E to "Convention Relating to Air Navigation"
Completed in This Issue—Subsequent Annexes Will Follow

Annex D

VI

General

49. Every aircraft manœuvring under its own power on the water shall conform to the Regulations for Preventing Collisions at Sea, and for the purposes of these regulations shall be deemed to be a steam-vessel, but shall carry the lights specified in the preceding rules, and not those specified for steam-vessels in the Regulations for Preventing Collisions at Sea, and shall not use, except as specified in paragraphs 17 and 20 above, or be deemed to hear the sound signals specified in the above mentioned Regulations.

50. Nothing in thse rules shall exonerate any aircraft, or the owner, pilot or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of the air, or by the special circumstances of the case.

51. Nothing in these rules shall interfere with the operation of any special rule or rules duly made and published relative to navigation of aircraft in the immediate vicinity of any aerodrome or other place, and it shall be obligatory on all owners, pilots, or crews of aircraft to obey such rules.

Annex E

MINIMUM QUALIFICATIONS NECESSARY FOR OBTAINING CERTIFICATES AS PILOTS AND NAVIGATORS

I

Certificates for Pilots of Flying Machines

(A.) Private Pilot's Flying Certificate
(not valid for purposes of public transport)

1. *Practical Tests:*

In each practical test the candidate must be alone in the flying machine.

(*a.*) *Test for Altitude and Gliding Flight.* A flight without landing during which the pilot shall remain for at least an hour at a minimum altitude of 2,000 metres above the point of departure. The descent shall finish with a glide, the engines cut off at 1,500 metres above the landing ground. The landing shall be made without restarting the engine and within 150 metres or less of a point fixed beforehand by the official examiners of the test.

(*b.*) *Tests of Skill.* A flight without landing around two posts (or buoys) situated 500 metres apart making a series of five figure-of-eight turns, each turn reaching one of the two posts (or buoys). This flight shall be made at an altitude of not more than 200 metres above the ground (or water) without touching the ground (or water). The landing shall be effected by:

(i.) Finally shutting off the engine or engines at latest when the aircraft touches the ground (or water).

(ii.) Finally stopping the flying machine within a distance of 50 metres from a point fixed by the candidate before starting.

2. *Special Requirements:*

Knowledge of rules as to Lights and Signals, and Rules of the Air. Rules for Air Traffic on and in the Vicinity of Aerodromes. A practical knowledge of international air legislation.

(B.) Pilot's Flying Certificate for Flying Machines Used for Purposes of Public Transport

1. *Practical Tests:*

In each practical test the candidate must be alone in the flying machine.

(*a.*) The tests for altitude and gliding flight and for skill are the same as those required for a private pilot's flying certificate. Candidates already in possession of the latter certificate are not required to pass these tests again.

(*b.*) Test of endurance consisting of a cross-country or oversea flight of at least 300 kilometres, after which the final landing shall be made at the point of departure. This flight shall be made in the same flying machine within eight hours. It shall include two obligatory landings (during which the machine must come to rest), which shall not be at the point of departure, but which shall be fixed by the judges.

At the time of departure the candidate shall be informed of his course and furnished with the appropriate map. The judges will decide whether the course has been correctly followed.

(*c.*) *Night Flight.* A thirty minutes' flight made between two hours after sunset and two hours before sunrise, at a height of at least 500 metres.

2. *Technical Examination:*

After satisfactory practical tests have been passed, candidates will, when summoned, submit themselves to examination on—

(a.) *Flying Machines:*

Theoretical knowledge of the resistance of the air as concerns its effects on wings and tail planes, rudders, elevators, and propellers; functions of the different parts of the machine and of their controls.

Assembling of flying machines and their different parts.

Practical tests on rigging.

(b.) *Engines:*

General knowledge of internal combustion engines, including functions of the various parts; a general knowledge of the construction, assembling, adjustment, and characteristics of aero-engines.

Causes of the faulty running of engines and of breakdown.

Practical tests in running repairs.

(c.) *Special Requirements;*

Knowledge of Rules as to Lights and Signals and Rules of the Air, and Rules for Air Traffic on and in the Vicinity of Aerodromes.

Practical knowledge of the special conditions of air traffic and of international air legislation.

Map reading, orientation, location of position, elementary meteorology.

Remarks

The practical tests shall be carried out within a maximum period of one month.

They may be carried out in any order, and each may be attempted twice. They shall be witnessed by properly accredited examiners, who will forward the official reports to the proper authorities.

The official reports will give the different incidents, especially those of landings. The candidates shall furnish before each test proper identity forms.

A barograph shall be carried on all practical tests, and the graph, signed by the examiners, shall be attached to their report.

Pilots who hold the military pilot's certificate shall be entitled to the private pilot's flying certificate, but, in order to obtain the pilot's flying certificate for purposes of Public Transport, it will be necessary to pass the technical conditions for navigation as required by B (2) (c.).

II

Certificates for Pilots of Balloons

1. *Practical Tests:*

The candidate must have completed the following certified ascents—

1. By day: 3 ascents under instruction.
1 ascent in control under supervision.
1 ascent alone in the balloon.
2. By night: 1 ascent alone in the balloon.

Each ascent shall be of at least two hours' duration.

2. *Theoretical Tests:*

Elementary aerostatics and meteorology.

3. *Special Requirements:*

General knowledge of a balloon and its accessories; inflation; rigging; management of an ascent; instruments; precautions against cold and high altitudes.

Knowledge of Rules as to Lights and Signals and Rules of the Air; Rules for Air Traffic on and in the Vicinity of Aerodromes.

Practical knowledge of international air legislation.

Map reading and orientation.

III

Certificates for Airship Officer Pilots

Every airship officer pilot shall have qualified as pilot of a free balloon.

There shall be three classes of airship officer pilots.

The holder of a first-class certificate is qualified to command any airship.

The holder of a second-class certificate is qualified to command airships under 20,000 cubic metres capacity.

The holder of a third-class certificate is qualified to command airships under 6,000 cubic metres capacity.

All military and naval airship officer pilots are entitled to a third-class certificate.

All military and naval airship officer pilots who have commanded airships over 6,000 cubic metres capacity are entitled to a first-class certificate.

Qualifications for Third-Class Certificate

Practical Tests:

(*a.*) Twenty certified flights (three of which shall be by night) in an airship, each flight being of at least one hour's duration. In at least four of these flights the candidate must have handled the airship himself, under the supervision of the commanding officer of the airship, including ascent and landing.

(*b.*) One cross-country flight on a predetermined course of at least 100 kilometres, terminating with a night landing, and made with a duly authorized inspector on board.

Theoretical Examination:

Aerostatics and meteorolgy. (Density of gases, laws of Mariotte and of Gay-Lussac; barometric pressure, Archimedes principle; confinement of gases; interpretation and use of meteorological information and of weather charts.)

Physical and chemical properties of light gases, and of materials used in the construction of airships.

General theory of airships.

Dynamic properties of moving bodies in air.

General Knowledge:

Elementary knowledge of internal combustion engines.

Elementary navigation; use of the compass; location of position.

Inflation; stowage; rigging; handling; controls and instruments.

Qualifications for Second-Class Certificate

Practical Tests:

To be eligible for a second-class certificate a candidate must be holder of a third-class certificate and have at least four months' service as a third-class officer on an airship; and also have completed at least ten flights as third-class officer on an airship of capacity above 6,000 cubic metres, in which he has handled the airship himself, including ascent and landing, under the supervision of the commanding officer of the airship.

Theoretical Examination:

Advanced knowledge of the subjects required for the third-class certificate.

Qualifications for First-Class Certificate

Practical Tests:

To be eligible for a first-class certificate a candidate must be holder of a second-class certificate, have at least two months' active service as a second-class officer on an airship, and also have completed at least five flights as second-class officer of an airship of capacity above 20,000 cubic metres, in which he has handled the airship himself, including ascent and landing, under the supervision of the commanding officer of the airship. Each flight must be at least of one hour's duration with a minimum of fifteen hours for the five flights.

Theoretical Examination:

As required for a second-class certificate.

IV

Certificate for Navigators

Aircraft used for public transport carrying more than ten passengers and having to make a continuous flight between two points more than 500 kilometres apart overland, or a night flight, or a flight between two points more than 200 kilometres apart over sea, must have on board a navigator who has been granted a certificate as such after passing a theoretical and practical examination in the following:

1. *Practical Astronomy:*

True and apparent movements of the celestial bodies. Different aspects of the celestial sphere.

Hour angles, mean, true, and astronomical time.

Shape and dimensions of the earth.

Star globes and maps.

Method of determining latitude, longitude, time, and azimuth.

2. *Navigation:*

Maps and charts—how to read them.

Compass; magnetic meridian; variation, deviation.

Courses, bearings, and their corrections.

Compensation of compass (technical and practical).

Calculations of azimuth.

Flight by dead reckoning, measure of the relative speed, drift, traverse table.

Chronometer, chronometer rate, comparisons.

Sextant, adjustments.

Nautical almanac.

Determination of positions by means of bearing and altitude of stars.

Knowledge of great circle navigation.

Aeronautical navigational instruments.

3. *General Knowledge:*

International rules for air and maritime navigation.

International air legislation.

Practical knowledge of meteorology and of weather charts.

V

Medical Certificates

1. Every candidate before obtaining a license as a pilot, navigator or engineer of aircraft engaged in public transport will present himself for examination by specially qualified medical men (flight surgeons), appointed by or acting under the authority of the contracting State.

2. Medical supervision, both for the selection and the maintenance of efficiency, shall be based upon the following requirements of mental and physical fitness:

(*Continued on page* 16)

Aeronautic News Items From Many Countries

Popularity and Commercial Worth of Aircraft Emphasized by Dispatches from All Quarters of Both Hemispheres

Handley Page Flights

Handley Page have now taken up nearly 3,000 paying passengers on the week-end flights this firm has been operating.

During the last months they have been running a regular service to Bournemouth, with a bombing machine converted into a comfortable passenger machine, leaving Cricklewood Aerodrome every Friday afternoon for Bournemouth and leaving Bournemouth for London every Monday.

Indian Visitors at the Handley Page Plant
Photo Western Newspaper Union

Their exhibits at the Amsterdam Exhibition consisted for the most part of two machines, one a big four-engine super-Handley and the other an absolutely new two-engine passenger carrying limousine aeroplane. The big four-engine machine was flown over to Brussels by Colonel Douglas. This machine left Cricklewood shortly after 7 a. m., reaching Brussels about 10 a. m. It caused quite a sensation in Brussels and thousands of people crowded on the aerodrome to see it in flight and landing. Many Belgian notabilities took a flight.

The new two-engine machine did not have the luck of its super brother. After setting out from Cricklewood on Saturday, July 26, it flew in record time to Calais, but from here onward its passage was extremely difficult. Over Breda it was caught in a severe hail storm and owing to other difficulties had to make a forced landing.

An extremely interesting sight was to be seen at Cricklewood Aerodrome August 27, when a party of 650 Indians visited the aerodrome and were shown round the works. A great percentage of this number were taken up for flights in a converted Handley Page bomber.

Cairo to France

Commander Vuillemin, an aviator, arrived last week at Villacoublay, near Paris, from Cairo, Egypt, having flown about 2,500 miles in three flights. The first stop was made at Constantinople, the second at Istres, twenty-three miles west of Marseilles, and the third at Villacoublay.

Flying Boat Trip

A successful demonstration was recently carried out by a flying boat of the Royal Air Force to the Scandinavian countries from England, according to an announcement made by the Air Ministry.

Starting from Felixstowe, Suffolk, and proceeding by way of Dundee, Scotland, the machine flew direct to Norway, landing at Christiansand. Thence by stages the plane visited Christiania, Copenhagen, Stockholm, Gossburg and Esbjorg, and then flew back to Felixstowe, a total distance of 2450 sea miles, which was covered in 40 hr. and 40 min. of actual flying time.

The flight, says the Air Ministry, was made entirely as a demonstration of the commercial use of flying boats. Notwithstanding the fact that from the time of its departure until its return to Felixstowe the craft spent a total of twenty-seven days on the water and in the air, no mishap of any kind occurred.

In Norway an exhibition flight was made before the King and Queen. The Queen was taken up on two occasions.

German Plane Delivery

Government subsidies for fast airplane mail service to neighboring countries for the purpose of enabling German newspaper publishers to land their morning papers in the principal cities and towns of Holland, Czechoslovakia, Latvia, Lithuania, Poland, Hungary and the Scandinavian countries on the day of publication is a form of propaganda strongly recommended by a writer in the "Vossische Zeitung."

The German writer takes Holland as an example of the need of this service and points out that the Dutch are well supplied with English and French papers, frequently forwarded by airplane. Some German publishers are making an attempt to compete in quick deliveries by using their own planes, but the writer insists that they cannot keep this up and that the only remedy is a special airplane newspaper mail service at low rates.

British to Sell Ships

In view of the economy campaign and the British government's decision to curtail the airship program, the Air Ministry has decided to dispose of a considerable number of airships and several stations, according to report.

These, together with a quantity of stores, will be offered for sale to private firms who are interested in the commercial development of aviation.

Among those ear-marked for disposal is R-80, a giant ship which has almost been completed by Messrs. Vickers at the Barrow Works, and the R-39, being built by Messrs. Armstrong Whitworths, which is considerably larger than any airship in the service. The Air Ministry is trying to find purchasers for these huge ships, and in the meantime work on them is suspended. Other uncompleted airships for sale are the R-36 and R-37.

If the Air Ministry is not successful in finding purchasers, the whole policy will have to be reconsidered, and it is possible, in view of the heavy cost of maintenance, that some of the airships will be demolished.

In any case this will likely be the fate of those whose construction are not advanced very far.

It is claimed that the R-39 is one-third bigger than the largest airship afloat. She is one-third built, and no final decision has yet been made of a suitable landing grounds and mooring posts, intention being that aerodromes will be provided at the more important stations, but in general the fear the ship will be scrapped is expressed.

It is expected that the Great Northern Aerial Syndicate, which purposes to establish air service between Liverpool and Australia, and Liverpool and New York, will bid for some of these airships. It is estimated that six huge vessels will be necessary to maintain these two services with any degree of regularity. The total financial backing necessary for such an undertaking is somewhere in the neighborhood of £2,500,000.

Planes for China

Lieut. C. E. W. Ricou, pilot in the French Army Air Service, has just come to New York from Macao, China, to organize a commercial flying service for several large cities in China, India and Siam.

Lieutenant Ricou has had a broad experience in the East, having been Chief of the French air forces operating in China. In addition to being an aviator, he is a capitalist and an engineer and has been prominent in starting large electric and water companies. He announces that he is financing the flying enterprise himself.

The plans will unite Shanghai, Hong Kong, Haifung, Canton, Tonkin and Macao by a commercial route, over which passengers and light freight will be carried.

During the war Lieutenant Ricou saw extensive service in the French campaign in Salonica and three times was shot down and wounded. After he had been ordered to China he was responsible for the crushing of a local rebellion, actuated by German influence.

Lieut. Ricou said that China had limitless opportunities for large aerial enterprises. As soon as he has closed a deal with an aircraft corporation in this city to build a large number of planes he will return to Macao. He will use Seagulls for coastal travel and Orioles for overland routes.

Airplane Vigilance

Sinn Feiners have encountered a new method of government vigilance. Last week a forbidden meeting at Armagh was discovered by authorities who soared overhead in an airplane.

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Formerly Air Service Journal

General Wood on the Independent Air Force

THAT Major-General Leonard Wood has come out boldly for an independent Air Force will give great encouragement to those who are supporting the bills now before Congress creating a separate service.

The public, which usually gives little thought to the technical details of the Army measures, will regard General Wood's opinion as that of an unbiased officer who looks at the future of aircraft in war from a broader point of view than that of the Army alone.

The next important opinion that will be heard will be that of General Pershing, who will probably appear before the committee within a few weeks' time. If the Commanding General of the A. E. F. should favor an independent Air Force or should suggest a radical change in the General Staff bill now pending, the probability of this Congress passing a special aviation bill would be greatly increased.

Meteorological Service

AN important move was made in England by turning over to the Royal Air Force a part of the meteorological work of the government. Just how complete this transfer was is not stated in the cables, but it indicates that the meteorological service of the past has not been giving the necessary data required for flying. Information regarding the weather has been used hitherto for purposes entirely different from aerial requirements and it is apparent that new methods must be employed to give records of the upper air stratas which will be useful to pilots.

The U. S. Weather Bureau gave invaluable information to the R-34 regarding the coming of a heavy wind storm and it was acted on immediately, but for commercial and wartime flying it is probable that the aeronautical pilots will want air facts more specialized than any weather bureau can furnish.

The National Balloon Race

THE St. Louis balloon race which is being organized by the Missouri Aeronautical Society is the first lighter-than-air event to be run since the war with Germany and as such is likely to elicit the keenest interest among balloonists throughout the United States.

In days past free balloons have played quite an important role in connection with national defense, particularly in the Franco-Prussian war, when scores of balloons were used by the besieged garrison of Paris for keeping up communications with the non-invaded portions of France. However, with the advent of self-propelled aircraft, to wit, airships and airplanes, the military potentiality of the free balloon has come to an end, save as a means for training pilots of lighter-than-air craft. In this function the old invention of the Montgolfier brothers has rendered extremely valuable services during the Great War, all kite-balloon observers and airship pilots formed during this epoch having received their preliminary training on free balloons.

With the advent of peace it would seem that the free balloon might fall into virtual disuse as this type of aircraft has no practical commercial value. However, it cannot be gainsaid that the free balloon affords a most pleasurable means of sport—in fact, it has often been called the king of sports. Before the war both in this country and in Europe many millions cubic feet of gas was yearly consumed by balloonists and international races where the personal skill of the aeronaut represents the most important factor in the outcome of such an event.

American balloon pilots have repeatedly won laurels against a brilliant array of foreign aeronauts and the revival of ballooning in this country augurs well that this magnificent sport will presently regain the prominence it held in *ante bellum* days.

A Lesson in Design

THE British Air Ministry's competition rules are like a lesson in design.

The object of the competition is to ascertain the best types of airplanes which will be safe to travel in, and in particular be capable of alighting in and rising from a small place.

The marking of the competing airplanes has been very carefully worked out and the series of rules enunciate very clearly and precisely what a practical, commercial airplane should be.

A circle of 175 yds. diameter for small machines, of 275 yds. for large machines, marked out on open ground but surrounded by an obstacle of continuous tape units. Streamers attached 50 feet from the ground represent excellently the landing field to whose dimensions an airplane designer should work.

The use of a claw attached to the machine as used on certain types of German machines is prohibited as causing possible damage to an aerodrome. This will check a somewhat facile method of ensuring short landing runs.

In a machine having two or more engines, the stoppage or retardation of any one engine must not prevent the machine from flying level nor cause it to get out of control. This rule lays emphasis on the principal point of advantage of the multi-motored type; its greater reliability as compared with the single-engined airplanes. It will induce designers to look well to their rudder area and to the placing of engines either close to the center of the airplane or in a central fuselage or nacelle.

Machines are to be capable of flying at cruising speed for five minutes without undue muscular exertion on the part of the pilot. This means that a premium is placed on the inherently stable machine, dispossessed of its rightful position of supremacy during the war, and now to come into its own again.

The design of the machines is to be such that the risk of the machines turning over on a rough ground is reduced to a minimum.

This freely interpreted means that the C. G. of an airplane should be well back of the axle, and if possible a system of small front wheels should be provided.

Self-sealing tanks are required. The general impression seems to be that such tanks are useful only for war purposes, but the Air Ministry seems very wisely to hold an opposite view.

Durability of machines is a feature, and advantages of metal construction are to be taken into account—a very significant fact.

Other interesting requirements are silence as affecting occupants of the machine including crew, and freedom of entry and exit for occupants.

The competition has been evidently very thoughtfully arranged, and although it is not open to American built machines, both its rules and subsequent results are worth careful watching.

News of the Army and Navy Air Services

Air Service Squadrons

Organization of two grand aerial groups, with a view to concentrating the air defenses of the Mexican border and the Atlantic coast at central headquarters, has been announced by the War Department. All squadrons and separate units engaged in border work are collected in the "first wing" to be based on Kelly Field, Tex.; headquarters for the "second wing," comprising all units on the Eastern seaboard, being established at Langley Field, Va.

The Army's Airplanes

Sixty-five per cent of the airplanes sent by the United States to the zone of the advance in France during the war were lost in military operations, the War Department has announced. Of the 2,698 airplanes sent to the zone of advance, 2,495 were delivered to troops, including airplanes lost at depots by accident, and of these delivered 1,755 were lost.

When the armistice was signed there were 943 planes in the zone of advance, 740 with armies and 203 in depots.

In the United States at present there are 9,183 Army airplanes in condition to use. Of these 4,781 are active, 2,215 obsolescent, 1,928 obsolete and 259 experimental.

Ships at Langley Field

Airship instruction at Langley Field has been progressing rapidly during the past week. At present the Army has only one small dirigible at Langley Field, but within a short time it is expected at least two or three larger dirigibles will be added to this station.

Officials hope that one of the new ships will be the latest designed French dirigible, built by the Zodiac Company for the United States Navy during the war. The ship has a gas capacity of 219,000 cubic feet, is 236 feet long, 49.2 feet wide, and 65.5 feet high. Originally it was fitted up with a 75 millimetre gun, but this probably will be removed before it is delivered to the army.

The cabin is most luxuriously fitted up and provides accommodations for ten or twelve passengers. It is said to give an excellent idea of the possibilities in future airship cabin design. It is believed in the Air Service that the French ship will be of sufficient volume to carry on very efficient instruction in the advanced work required of an applicant for the rating of dirigible pilot. Ships of this size require at least three officers for their proper navigation.

In addition to the French dirigible it is contemplated sending one or more of the "C" type airships of the navy to Langley Field. These ships will be duplicates of the C-5, which was jerked from her moorings at St. Johns, N. F., and lost at sea while being refuelled and overhauled preparatory to a transatlantic flight. It has a gas volume of 175,000 cubic feet. The Army dirigible shed at Langley Field, large enough to house all these ships, will be finished about Oct. 1.

NC-4 Recruiting Flight

The itinerary of the NC-4 aerial recruiting expedition from Atlantic City to New Orleans was announced last week by the Navy Department. The trans-Atlantic seaplane, commanded by Lieutenant Commander A. C. Read, who piloted the NC-4 across the Atlantic, accompanied by the Isabell, will leave Atlantic City Sept. 23.

The itinerary is as follows: Rockaway, Sept. 25; Portland, Maine, Sept. 27; Boston, Oct. 1; Providence, R. I., Oct. 3; New Haven, Oct. 6; Philadelphia, Oct 11; Baltimore, Oct. 15; Washington, Oct. 19; Norfolk, Oct. 23; Charleston, Oct. 27; Jacksonville, Oct. 30; Miami, Nov. 3; Pensacola, Nov. 4, and New Orleans, Nov. 8.

St. Louis Balloon Race

A step toward regaining the prominence that balloon racing had attained before the war, is indicated in the announcement of a National Balloon Race to start at St. Louis, Mo., Oct. 1, 1919. The first balloon race to be held in this country since the close of the war was the one starting at Akron, Ohio, last May, when seven spherical balloons were sent up from the Wingfoot Lake Naval Air Station, formerly the flying field of The Goodyear Tire & Rubber Co., since taken over by the U. S. Navy. But the balloons in this race were all Akron balloons, piloted by civilians and Army and Navy men from that city.

The race to be held at St. Louis is open to all American pilots. The winner is to be styled the champion balloonist of the United States and will receive a prize of $500. Second place will capture $300, and third $200.

The coming race will have among its entries some of the most noted pilots of the country, a number of whom have participated in former national balloon races. Ten balloons have already been entered, by such noted balloonists as Capt. Elmer G. Marschuetz, Capt. C. W. Dammann, E. S. Cole, J. S. McKibben, G. L. Bumbaugh, H. E. Honeywell, Ralph Upson, Warren Rasor, Wm. Assman and P. M. McCullough.

One of the best known American pilots is Ralph Upson, present holder of the title of world's champion balloonist, won in the International Race held at Paris in November, 1913, in the Balloon "Goodyear," in competition with pilots from all parts of the world.

In the St. Louis race, Upson, who is chief aero engineer for The Goodyear Tire & Rubber Co., will pilot the "Goodyear II,' which is of the same gas capacity, 80,000 cubic feet, as his 1913 balloon, but has a better bag, as considerable progress has been made in the manufacture of balloons since the outbreak of the war. Upson's aide in this race will be W. T. Van Orman.

Balloon men are expecting a big revival in balloon racing in this country as a result of the National race at St. Louis. Thousands of young men have become balloon pilots since America's entry into the war and have seen active service with our expeditionary forces. These men and their friends are certain to take an added interest in ballooning in this country because of their service abroad. At the Wingfoot Lake Naval Air Station alone, 2,500 young men received training in piloting balloons during the war, in addition to those who received their training at other Naval Air Stations.

There is, of course, no way of controlling the course taken by a balloon, except that an experienced pilot, fully acquainted with air currents and atmospheric conditions, may in a measure control the direction taken by a balloon, by ascending or descending from one strata of air to another. In a balloon race the prime requisite is to keep the bag in the air and to keep its course as straight as possible, for the winning balloon is the one that travels the greatest airline distance from the starting point.

Arrangements for the St. Louis race are in charge of Major A. B. Lambert, of the U. S. Army Air Service and all prizes will be awarded by the Missouri Aeronautical Society.

As a preliminary to the big race three balloons will be sent up on Sept. 26 piloted by crews from the Pensacola Naval Air Station, the Wingfoot Air Station and the Navy Department at Washington, D. C.

Plans Novel Leap

One of the feature stunts of an air circus at Seattle, Wash., has been billed for the fall fair at Lewiston, Idaho. Sergt. R. E. Cadden, formerly of the United States Army, will make a leap from an airplane while looping the loop at an altitude of from 2000 to 3000 ft., using a parachute.

Lieut. Jay L. Warner and Lieut. Richard Hoyt, both formerly of the United States Air Service, will also give exhibitions.

New Coast Company

The incorporation of a new organization to promote and control aircraft transportation and known as the California, Great Western and Interstate Air Route, has been announced by R. J. Daum at a meeting of fifty business men at the Athletic Club in Los Angeles, Cal. The plan of the company, which is incorporated at $1,000,000, is to develop commercial aviation throughout the West.

The company, according to report, plans to promote, establish, maintain and operate chains of various types of aircraft and landing stations and will make every effort to stabilize the air industry. Fields have been selected and plans drawn for complete landing stations at Los Angeles, San Francisco, Oakland, Sacramento, Phœnix, Yuma and other points. All fields and landing stations are to be standardized.

Offices and hangars costing from $2,000,000 to $3,000,000 will be erected on each field, according to the plans. The home company is to sell the transportation and act as the central administration. Routes are to be charted and marked by lights and other devices.

Fields in Northwest

Commercial landing fields will be located and mapped out in all cities and towns of the northwestern states, according to plans made by Lieut. Floyd Kelso, former Army aviator, of Kennewick, has started on a tour of the inland states and western Montana. He has already completed an examination of western Washington and the Big Bend country.

A high powered three-passenger airplane with completely equipped limousine body, has been ordered from a New York firm by Mr. Kelso for early spring delivery. He intends to fly the ship from coast to coast, leaving from New York and landing on a field already mapped out on Mount Ranier.

"The snow is crusted near the summit and is as smooth and hard as any street," said Mr. Kelso. "Winter flying is just a matter of convenience and with a closed passenger ship will be as comfortable as motoring."

Exhibition in Idaho

Lieut. R. P. Parshall, aviator, and Ernest Schneider, airplane owner, are to fly from Yakima, Wash., to Lewiston, Idaho, to give exhibitions at the Lewiston fair. Yakima claims the distinction of possessing the youngest passenger ever taken on an aerial trip in the person of Ruth O'Keefe, age 21 months, who was taken up by her father. The youngster is said to have registered joy at the experience.

Mrs. A. C. Read Up

Mrs. Albert C. Read, wife of the naval lieutenant-commander who first crossed the Atlantic in a plane, enjoyed her initial trip in a plane last week.

Aviators' Club of Pa.

With more than 300 former Army, Navy and Marine Corps fliers enrolled, the Aviators' Club of Pennsylvania, although only a month old, decided at a joint meeting with the Aero Club of Pennsylvania recently not to merge with the Aero Club, as had been proposed by that organization, when Joseph A. Steinmetz, president, proposed a reorganization.

Capt. C. R. Collins

For the present the Aviators' Club will continue as an individual organization. Arrangements have been completed with the "Pen and Pencil Club," one of the best reputed organizations in Pennsylvania, for joint use of their pretentious clubhouse at 1026 Walnut Street, where activities will be conducted by the fliers.

At the meeting resolutions were passed, to be forwarded to President Wilson, both houses of Congress and the heads of the Army and Navy, calling on them to favor a Federal Department of Aeronautics, headed by a Cabinet officer, and offered to place the help and advice of the membership of the Aviators' Club, every one of whom is a flier, in framing such a body or department and necessary aeronautical legislation. Communications were also sent to the Governors' Conference at Salt Lake City requesting that body to act to rush the formation of an air department. In reply Governor Burnquist of Minnesota wired: "I have placed your proposition in the hands of the proper committee of Governors for consideration. I am strongly in favor of the proposed aeronautical department."

Arrangements are being made to immediately obtain and place at the disposal of the members of the club several planes, in order that they may keep in flying trim and take an aerial jaunt occasionally.

"Steps will be taken to add to the membership of the Aviators' Club during the fall and winter months," Capt. Claude R. Collins, president of the club, declares. "Only fliers will be taken in as active members, and it is believed that before the winter is over at least 1500 former service aviators will have been enrolled. We intend to do everything possible that will be of benefit to fliers and aviation in America.

"Right now we have two big matters facing us. One is the attempt to push to a reality the proposed Department of Aeronautics at Washington; the other the construction of a $1,000,000 civic airdrome and country clubhouse here. The civic airdrome seems practically assured now, and if constructed as planned will be a model for the entire world.

"Fliers now in the service, or those discharged, are urgently invited to make use of the Aviators' Club rooms at 1026 Walnut Street, in the heart of the city, when in Philadelphia. An attempt is being made to retain the old Army and Navy spirit, and therefore formalities are limited."

Captain Collins, president of the club, is a member of the New York City Aero Police, on special detail in Philadelphia. He is aviation editor of Philadelphia *Press*. Captain Collins has been employed on various metropolitan newspapers in executive positions previous to entering the Army, and has written a number of technical and feature articles on aviation for magazines and newspapers.

H. M. S. Furious, Largest Floating Airdrome in the World
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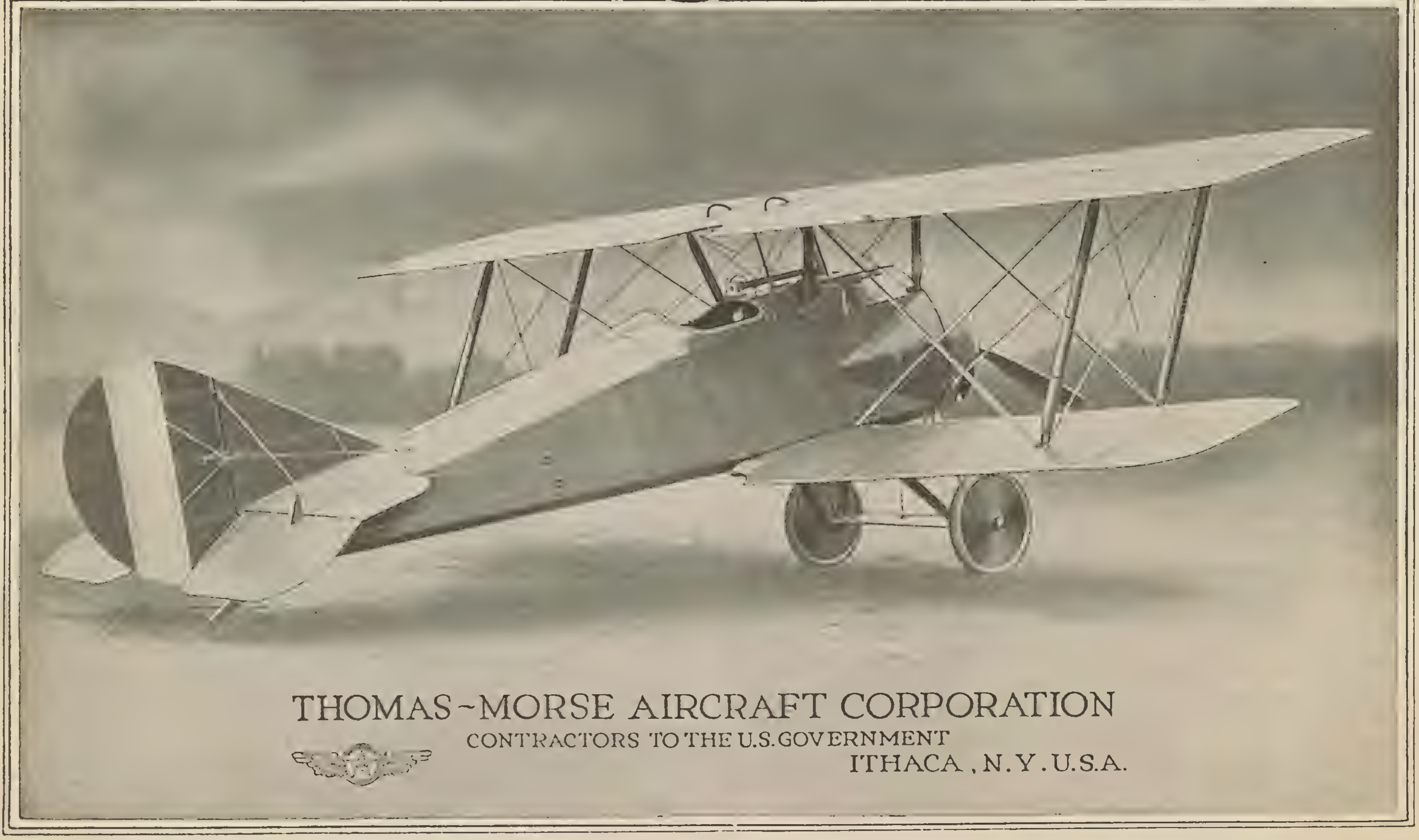

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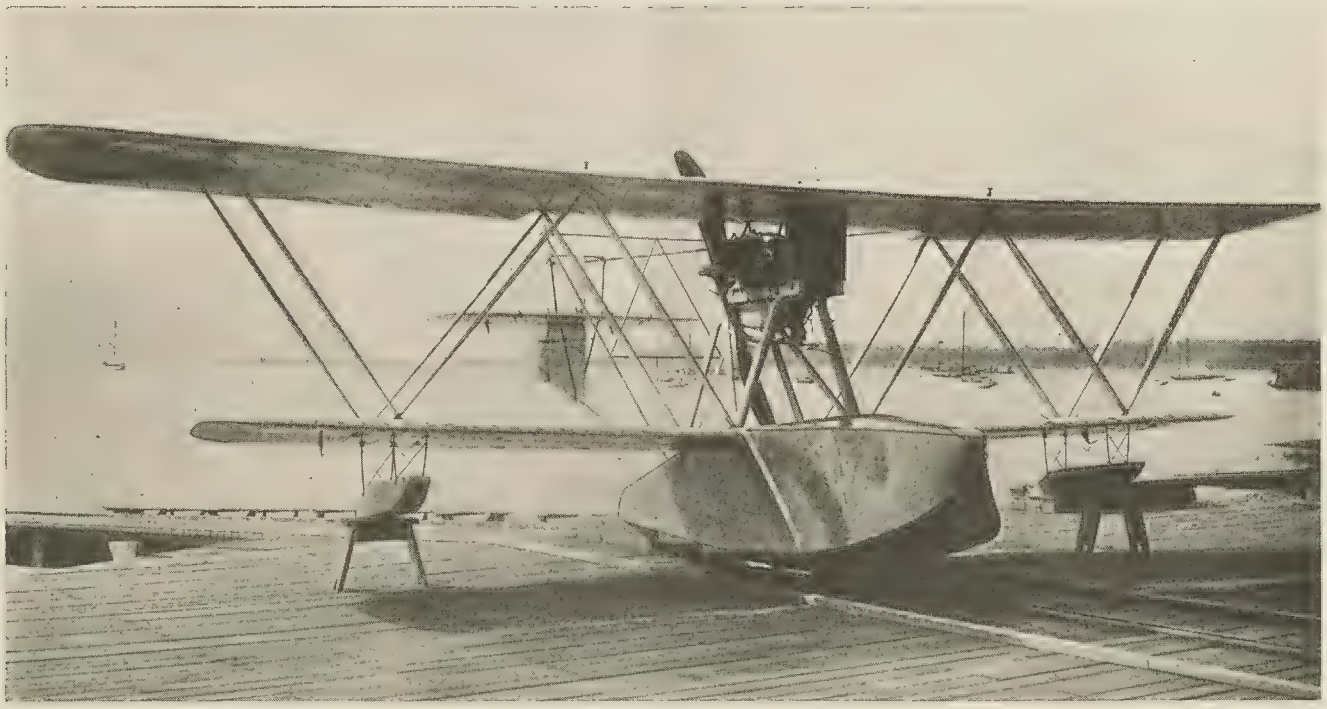

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¶ Made by the manufacturers of the famous VOUGHT VE-7 Airplanes.

¶ Equipped with 150 HP. Hispano-Suiza, or OX-5 motor.

PERFORMANCES, STRENGTH AND QUALITY GUARANTEED

Early Deliveries

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U. S. Navy Sale

After a careful survey of the flying equipment of the Navy, sale has been authorized of a large quantity of heavier-than-air equipment, which is in excess of the present needs of the Navy. This flying equipment is standard manufacture, accepted by the Navy after stringent inspection. It has been held in storage and most of the equipment is in excellent condition.

The sale will be made by sealed proposals received up to 2 p. m. September 22, 1919, at the Bureau of Supplies and Accounts, Salvage and Sales Section, Navy Department, Washington, D. C. There are 219 flying boats and seaplanes to be sold and 441 engines, exclusive of those installed in the boats or to be supplied to them when they are sold.

Bids will be received on any quantity of seaplanes, flying boats or engines, from one to the entire quantity. The schedules of sale accurately describe the material and bidders may bid on an individual boat or engine, or several of them, or on an entire class. The appraised value of each flying boat, seaplane and engine is given in the schedule of sale.

Awards will be made when the bids are above the appraised value. When bids are below the appraised value, awards may or may not be made. As the awards will be made to the highest bidder, alternate bids are invited so that if a bidder desires he may bid on several planes, stating in his bid the quantity of planes or engines desired.

There will be offered 83 H-S-2-L flying boats. These are pusher biplanes, upper wing spread 74 ft., 3 place, approximate speed 91 miles per hour. These are stored at the Fleet Supply Base, South Brooklyn, New York. Some of these flying boats are fitted with radio equipment. With each flying boat one new 330 h.p. Liberty engine will be furnished. These are all new boats in good condition, many of them in the original crates.

Another attractive class of seaplanes which will be offered is a lot consisting of 52 H-16 seaplanes and 20 F-5-L. These are tractor biplanes, with an upper wing spread of 95 feet and an approximate speed of 95 and 87 miles per hour. They are 4 and 5 place machines and each will be fitted with two new 330 h.p. engines. These are stored at the Naval Aircraft factory, Philadelphia, Pa.

Memorandum of Sale of Flying Boats and Engines:

Among the small machines to be sold are 50 aeromarine type 39-B seaplanes with single float. These have an upper wing spread of 47 feet. They are two-place machines, each fitted with a Curtiss OXX-6 100 h.p. engine in place. The approximate speed is 68 miles per hour. These are stored at Naval Aircraft Storehouse, Gloucester, N. J.

Among the small machines to be sold are also 10 Aeromarine model 40 flying boats, stored at the Army Supply Base, Norfolk, Va. These are two-place boats, upper wing spread 48 ft. 4 in., equipped with engines, approximate speed 70 miles per hour.

The 441 separate engines to be sold are all in storage at the Naval Aircraft Storehouse, Gloucester, N. J. The largest single lot consists of 250 Curtiss OXX-6 engines of 100 h.p. each, which are new. There are also 51 Hispano-Suiza engines, 220 h.p. each, foreign built.

There will be 72 used Curtiss engines offered for sale; also 20 used Hall-Scott engines, 9 Salmson Hydro-Glycier engines, 220 h.p. each, and 32 100-h.p. Gnome engines, new and used.

This material is all stored at the Fleet Supply Base, South Brooklyn, New York; Naval Aircraft factory, Navy Yard, Philadelphia, Pa.; Naval Aircraft Storehouse, Gloucester, N. J.; Naval Air Station, Hampton Roads, Va., and Army Supply Base, Norfolk, Va. Inspection is invited and may be arranged with the Supply Officers at the above stations.

It is believed that this method of offering surplus aircraft for sale will so widely distribute the material as to benefit aviation in general by affording everyone interested an opportunity to buy new planes at very reasonable figures. The bidders will be expected to examine the planes before purchasing and the Navy will load them on trucks, lighters or open end freight cars, but will not set them up preparatory to flight.

In order to make the sale complete arrangements have been made to supply each of the larger classes with all accessories and instruments furnished in the regular navy equipment for that type of plane. In addition handling trucks are included and many sets of spares.

New United Directors

F. G. Diffin, president of the United Aircraft Engineering Corporation, announces the election of Major George R. Wadsworth as second vice-president of the company. Major Wadsworth is in charge of Transportation Development Work, which includes the establishment of municipal landing fields and air routes in all parts of the country for passenger carrying and light express. During the war he was Chief Engineer of the Naval Aircraft Factory at Philadelphia, and proved to be a valuable asset to the Government.

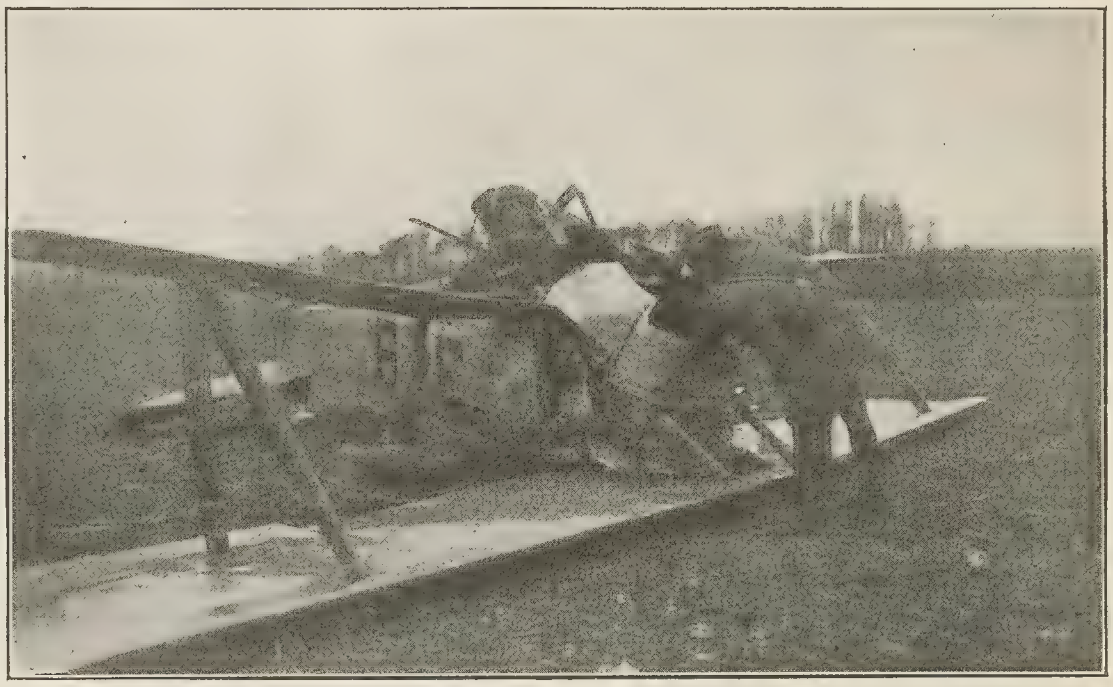
The election of Major Wadsworth and Chance M. Vought as Directors of the United Aircraft Engineering Corporation is also announced.

New Plane Carries 24

A Leipzic telegram states that what is claimed to be the largest airplane in the world, manufactured by the Aviatik Works of Leipzic, has just carried out its first flights.

Its dimensions are approximately 130 ft. in span, 73 ft. in length and 20 ft. in height.

It is fitted with two 500 hp. and two 250 hp. Benz engines, and is capable of carrying, besides the commander, two navigators, two mechanics, one steward and eighteen passengers with luggage.



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WRIST CHRONOGRAPHS

PLAIN AND LUMINOUS DIALS

ILLUSTRATION SHOWS CHRONOGRAPH ACTUAL SIZE

No. 123714C.

The only practical "Aviators" split wrist chronograph. 18 jewels. Sterling silver case. Hands and figures treated with a special two year guaranteed radium material passed by U. S. Gov. Furnished with special "Aviators" wrist strap. Suitable for wearing outside of coat sleeve. Price, Net, $60.00

While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

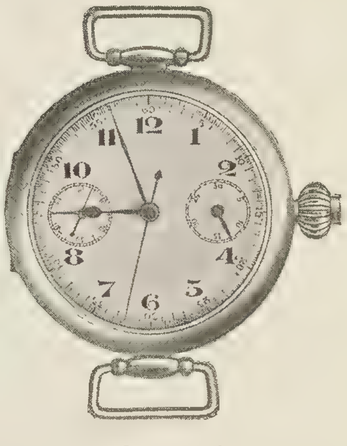
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS CHRONOGRAPH ACTUAL SIZE



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Smaller size "Aviators" split wrist chronograph. Furnished with or without radium hands and figures. Guaranteed two years. 18 jewels. Adjusted to heat, cold, ichronism and thoroughly reliable. Sterling silver case. Furnished with web strap, sterling silver buckle. Price, Net, $60.00

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Rohlfs Up Again

Taking the air merely for a test flight, Roland Rohlfs, pilot for the Curtiss Aeroplane and Motor Corp. at Roosevelt Field, Mineola, is said to have reached a height of 34,200 feet Sept. 13.

Because of the informal manner of his performance, without even a member of the Curtiss organization as witness, and without officials present to seal his instruments for calibration, the record will not receive official recognition. Rohlfs intends to remedy that on the first favorable day.

The previous unofficial world's record was 33,136 feet, made by Adjutant Casale of the French Army last June. In July Rohlfs flew to a height, as shown by his barograph, of 30,700 feet. This was an official flight, but the report on his instruments has not yet been made. Until it is proved and promulgated, the world's official record stands at 28,900 feet, made by Major R. W. Schroeder at McCook Field, Dayton, O.

The machine Rohlfs flew Saturday was the same Curtiss "Wasp" triplane, powered with a Curtiss K-12 400 horse power motor, with which on July 30 he flew 30,700 feet high, and was prevented from going further by the chilling of the motor. Since that attempt such a contingency had been provided against by fitting shutters to the radiator, and on Saturday the engine worked perfectly.

It was 11 o'clock in the morning when, accompanied only by a mechanic and observed only by a few soldiers at the field, Rohlfs started his motor for its warming up. He expected to reach a level where it was cold and had dressed accordingly. A new feature of his own devising was a pair of felt mittens, fingerless and thumbless and half an inch thick, worn over a pair of thin gloves and a pair of fur-lined gloves. He found them a great comfort at 34,000 feet, where his thermometer registered 44 degrees below zero.

On his feet were three pairs of socks and a pair of hunting boots of sheepskin, wool inside. A pair of heavy woolen trousers was drawn on over his ordinary ones, and a heavy sweater over a couple of lighter ones. Over all was a heavy fur-lined flying suit. His head was protected by a chamois helmet, with holes for the eyes and nose. A mask with goggles afforded a further barrier against the cold, and over this his oxygen mask was adjusted.

Roland Rohlfs
Courtesy Curtiss Aeroplane & Motor Corp.

His clothing proved better chosen than on his previous flight, but guarded as he was, the cold found a point of attack, for at the peak of his climb he was attacked by pains in his head so sharp as to give him grave concern. It wore off before he returned to the earth, so that he concluded it was attributable to the temperature, rather than to the unaccustomed rarity of the upper air.

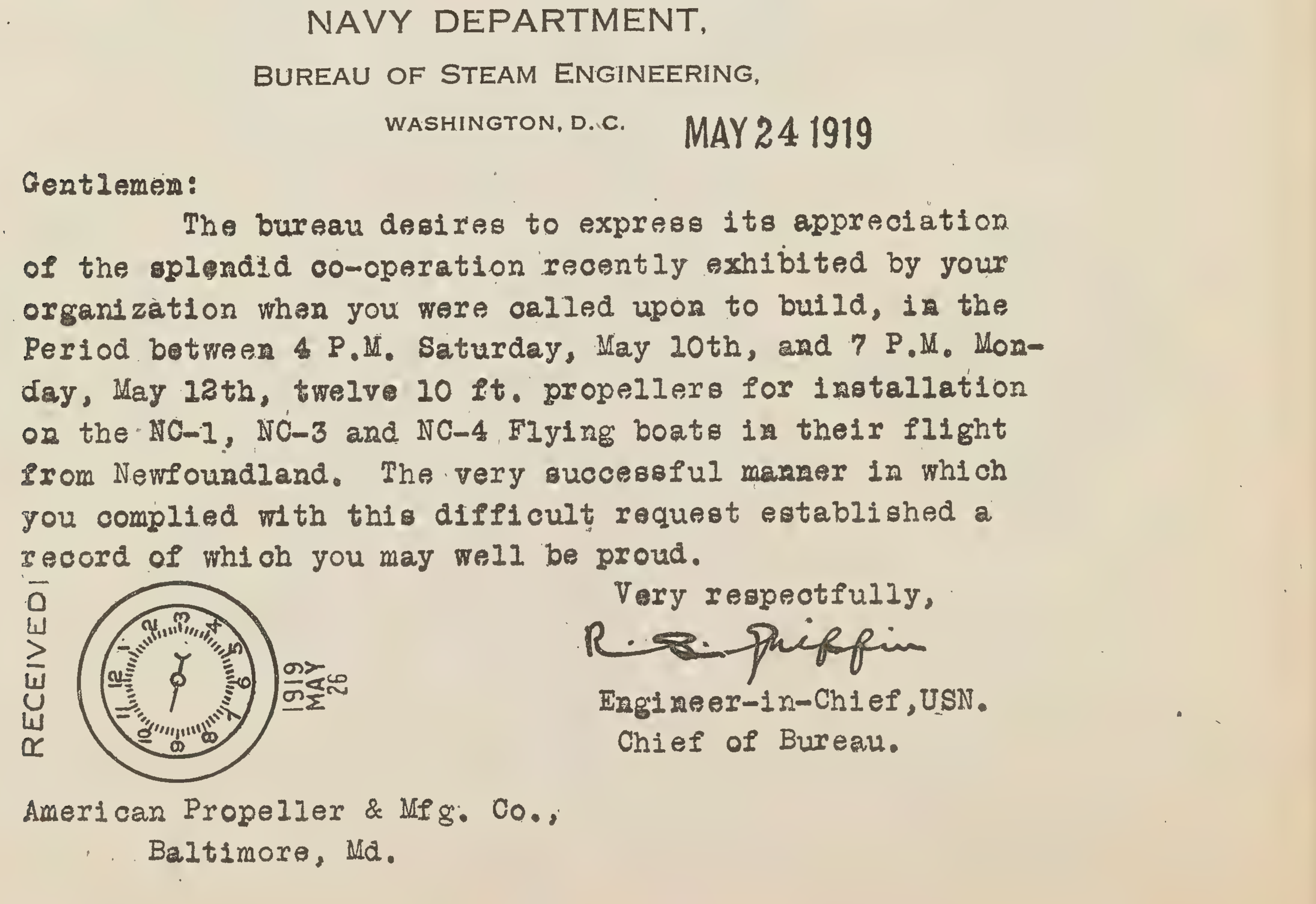
It was 11.11 o'clock when he took the air and in one hour his instruments showed an altitude of 34,000 feet. That was as high as his aneroid was geared to register, but his barograph allowed him some leeway, so for seven minutes he had gone 200 feet more. There he straightened out his plane.

Rohlfs made a strange observation in the last 200 feet of his climb. Being interested in conditions at an elevation which holds few charms for most people, he had read with attention a few days ago a scientific article on what the writer called a "temperature lid" at 40,000 feet or so above the earth's surface, above which, the article said, a warmer zone is reached. Rohlfs found the "temperature lid" at 34,00 feet. At that point his thermometer reached its minimum of 44 degrees below zero. Seven minutes later, at 34,200, it registered 40 degrees below.

So clear was the air that there seemed no limit to his field of vision. The whole of Long Island was spread out below him, with New York a pin point to the west and a seemingly boundless horizon. He had kept pretty well over Roosevelt Field in the ascent, but the wind was pushing him eastward, and he could see Lake Ronkonkoma below him, so he turned his nose earthward. With the motor running to keep the radiation system from freezing, with the possibility of bursting pipes, but well throttled down, he made the descent in thirty-seven minutes.

New British Record

The Royal Aero Club has accepted as a British record for a closed circuit the speed of 129.3 m.p.h. attained by Captain Gathergood when he won the Aerial Derby with an Airco machine fitted with a Napier engine.



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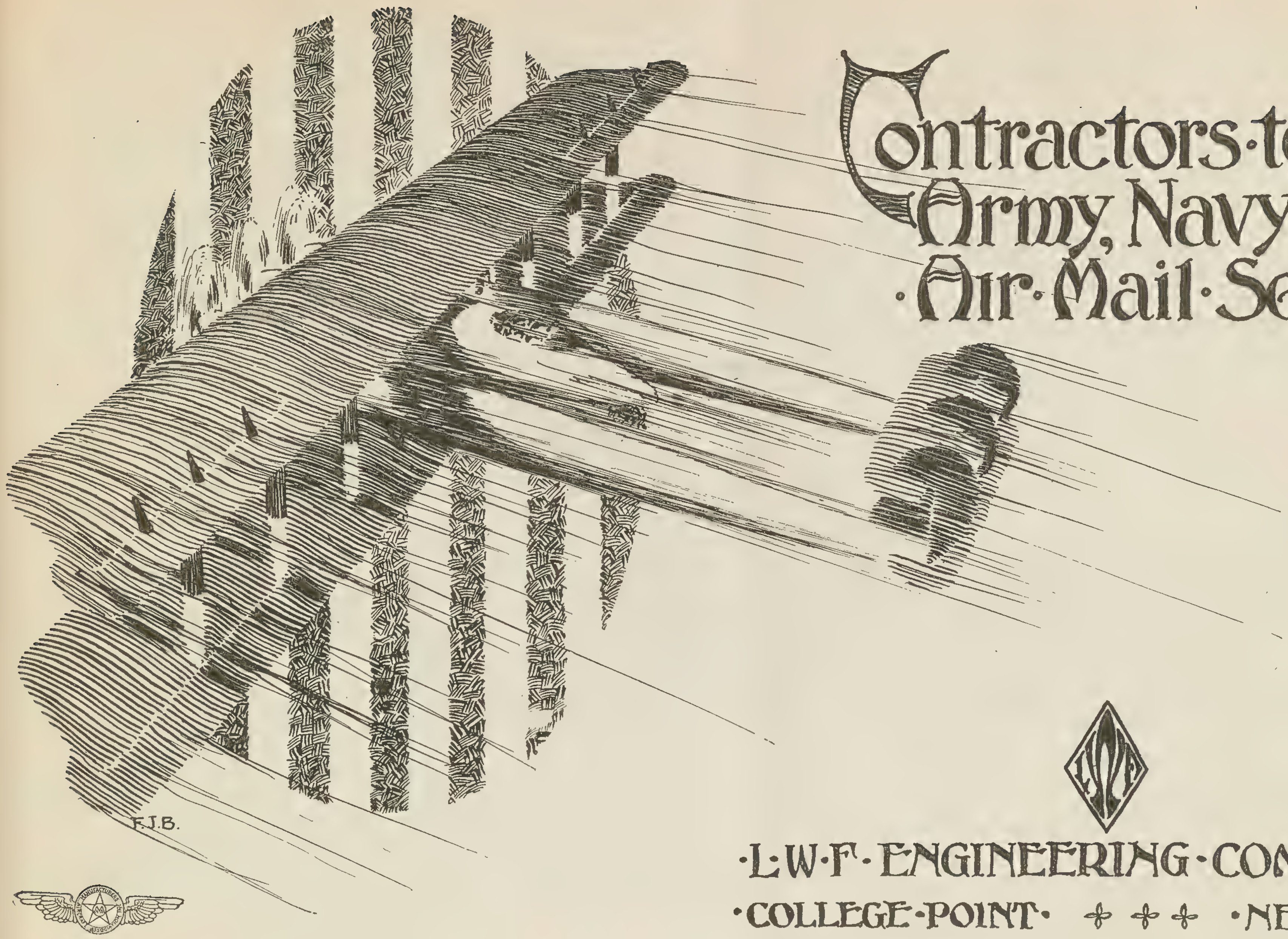
Gentlemen:

The bureau desires to express its appreciation of the splendid co-operation recently exhibited by your organization when you were called upon to build, in the Period between 4 P.M. Saturday, May 10th, and 7 P.M. Monday, May 12th, twelve 10 ft. propellers for installation on the NC-1, NC-3 and NC-4 Flying boats in their flight from Newfoundland. The very successful manner in which you complied with this difficult request established a record of which you may well be proud.

RECEIVED 1919 MAY 26

Very respectfully,
R. S. Griffin
Engineer-in-Chief, USN.
Chief of Bureau.

American Propeller & Mfg. Co.,
Baltimore, Md.



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Texas Mayor in Air Trip

Frank W. Wozencraft, Mayor of Dallas, Tex., who is studying the New York City government in order to get progressive ideas for Dallas, surveyed New York from the air last week.

Mayor Wozencraft, with Lieut. Lucas B. Beau as navigator, left Hazelhurst Field, Mineola, flying across Long Island and over the metropolis, circling the Statue of Liberty and returning to the Long Island landing field.

"I was especially interested in how your street traffic was controlled," said the Dallas Mayor when he returned from his trip, "and the place to fully appreciate the efficacy of your traffic control system is from the air. From 1,500 feet in the air, the altitude we attained, the sight of moving people and vehicles was really wonderful and is one that I shall not soon forget."

Entertains Prince

The Prince of Wales' train was escorted during his travels in Canada last week from the Leduc district, twenty miles from Edmonton, by Capt. Wilfred May in an airplane called City of Edmonton, which circled above the royal cars. The aviator performed many daring feats to the delight of the future ruler of the British Empire.

Captain May flew very low for the first thousand yards, close to the train, rising only when he came to fences and trees. His exhibition was the talk of the royal party long after its arrival in the provincial capital.

Flying in Spokane

A matron of 80, a maid of two summers and a Chinese merchant are among the Spokane, Wash., people who have flown in planes recently. A 300-lb. Indian also applied for a ride. Many women are patronizing the aviators.

Long Seagull Flight

Major S. E. Parker and Captain G. Talbot Willcox, two former Royal Air Force pilots who were on the fighting front in France for several months, have left New York on a flying trip to New Orleans. Following the Hudson, St. Lawrence, Ohio and Mississippi Rivers, the pilots expect to reach New Orleans in time for the Mardi Gras. The trip is the longest ever made by a small flying boat, covering nearly 5,000 miles. The trip is being taken to awaken interest in aviation and stops will be made at all of the larger cities and summer resorts when the aviators will deliver lectures on aerial topics.

The trip is being made in a Curtiss Seagull three-passenger flying boat, equipped with a Curtiss Six, 150 horsepower motor. It is equipped with wireless telephone and telegraph, enabling passengers to talk on the ground, and also to send messages to distant points. This is the first time that a civilian flying craft has been fitted out with this equipment. The pilots may, upon reaching New Orleans, continue around the Gulf of Mexico to Panama and South America.

Peace Treaty Convention

(*Continued from page* 6)

(*a.*) Good family and personal history, with particular reference to nervous stability. Absence of any mental, moral or physical defect which will interfere with flying efficiency.

(*b.*) The minimum age for pilots and navigators engaged in public transport shall be nineteen (19) years.

(*c.*) *General Surgical Examination.* The aeronaut must neither suffer from any wound, injury or operation nor possess any abnormality, congenital or otherwise, which will interfere with the efficient and safe handling of aircraft.

(*d.*) *General Medical Examination.* The aeronaut must not suffer from any disease or disability which renders him liable suddenly to become incompetent in the management of aircraft. He must possess heart, lungs, kidneys, and nervous system capable of withstanding the effects of altitude and also the effects of prolonged flight.

(*e.*) *Eye Examination.* The aeronaut must possess a degree of visual acuity compatible with the efficient performance of his duties. No pilot or navigator shall have more than two (2) dioptres of latent hypermetropia; muscle balance must be good and commensurate with the refraction. He must have a good field of vision in each eye and must possess normal color perception.

(*f*) Ear Examination. The middle ear must be healthy. The aeronaut must possesse a degree of auditory acuity compatible with the efficient performance of his duties.

(*g.*) The vestibular mechanism must be in tact and neither unduly hypersensitive or hyposensitive.

(*h.*) *Nose and Throat Examination.* The aeronaut must possess free nasal air entry on either side and not suffer from serious acute or chronic affections of the upper respiratory tract.

3. Each contracting State shall for the present fix its own methods of examination until the detail of tests and the minimum standard of requirements have been finally settled by the authorized medical representatives of the International Commission for Air Navigation.

4. The successful candidate will receive a medical certificate of acceptance, which must be produced before the license can be issued.

5. In order to insure the maintenance of efficiency, every aeronaut shall be re-examined periodically, at least every six months, and the findings shall be attached to his original record. In case of illness or accident also, an aeronaut shall be re-examined and pronounced fit before resuming air duties. The date and result of each re-examination shall be recorded on the aeronaut's flying certificate.

6. No aeronaut who, before the date of the present Convention, has given proof of his flying ability, shall, so long as he retains such ability, be necessarily disqualified because he fails to fulfil all of the above requirements.

7. Each contracting State may raise the conditions set forth above, as it deems fit, but these minimal requirements shall be maintained internationally.

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A limited number of these sturdy, world-renowned machines—brand new—with or without engines, are now being offered at an attractive price.

Two or Three-Seater type.

Hydro if preferable.

Act quickly if you want a profitable investment.

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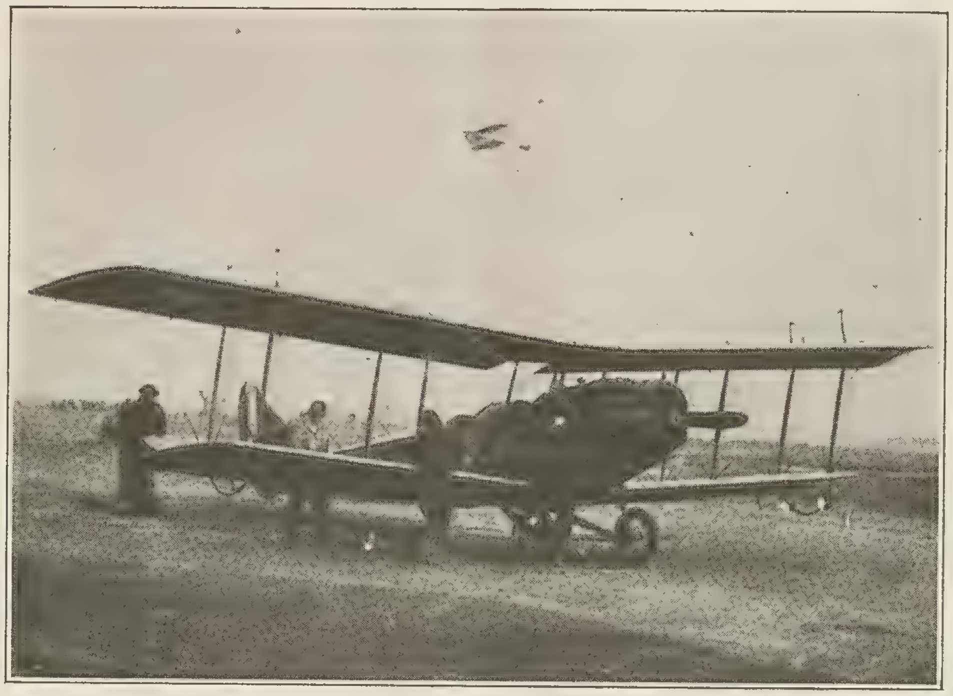

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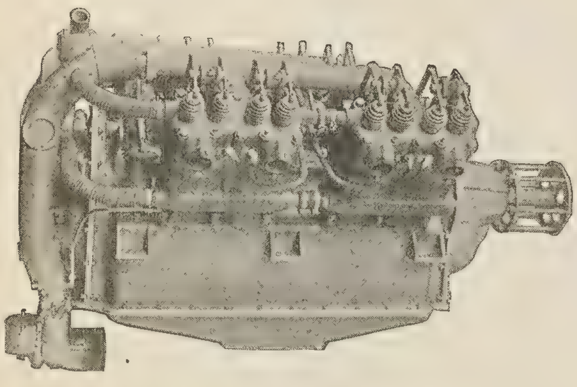

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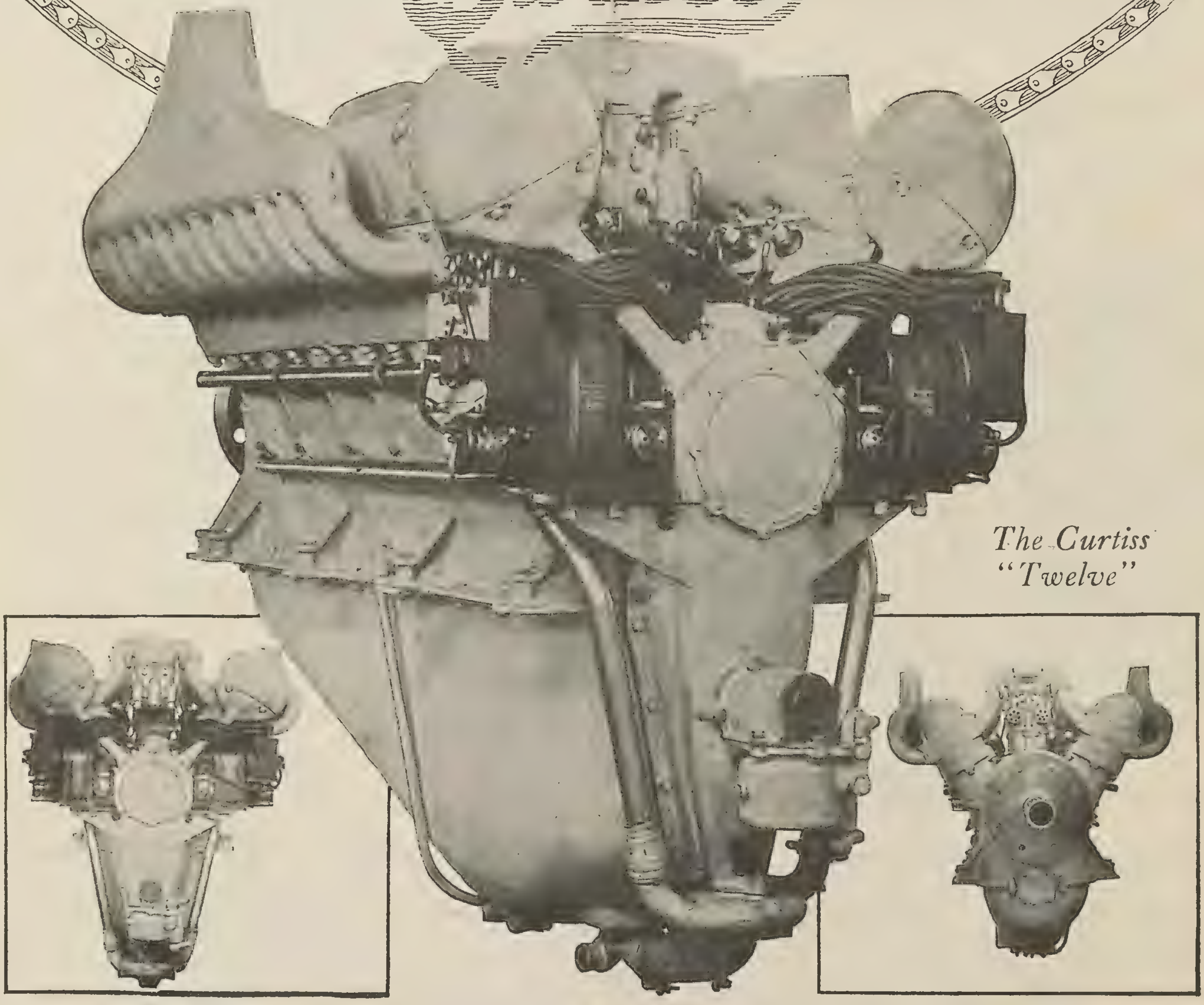

The Curtiss "Twelve"

131

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AIRCRAFT JOURNAL

September 27, 1919 *Every Saturday* *Price Ten Cents*

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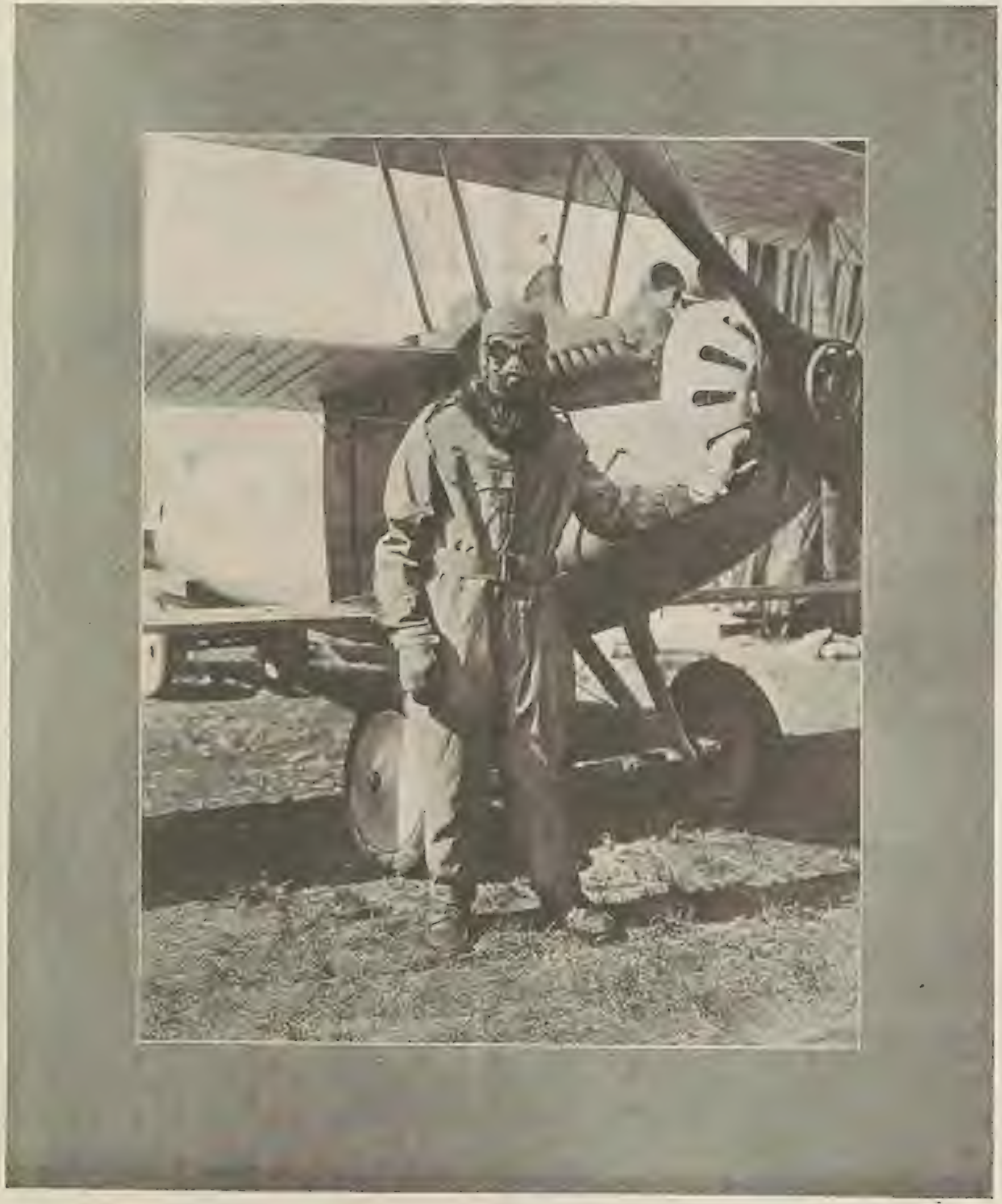
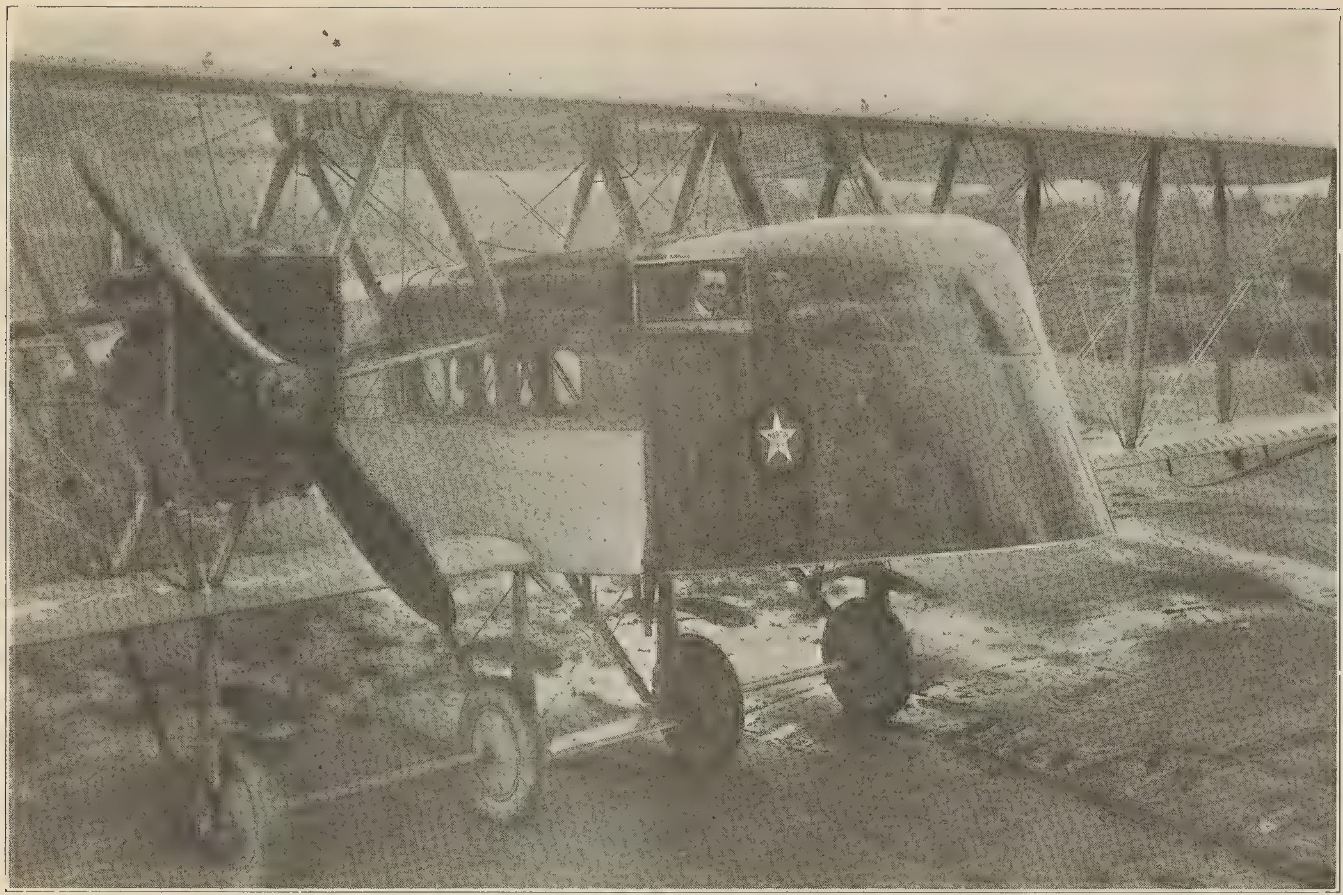


Roland Rohlfs Dressed for His World's Record Altitude Flight in the Curtiss Triplane "Wasp"—He Climbed 34,610 Feet on September 18



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Roland Rohlfs' Altitude Record

Climbs 34,610 Feet in a Curtiss "Wasp" Triplane with No Supercharger

Roland Rohlfs, testing pilot for the Curtiss Aeroplane and Motor Corp., of Garden City, climbed 34,610 feet above Roosevelt Field, Mineola, Sept. 18, breaking the world's record for altitude.

The barograph reading will be accepted as official by the Aero Club of America when it has been certified by the Government Bureau of Standards in Washington.

Rohlfs' flight of Sept. 18 breaks his July record of 30,700 feet and his unofficial record of 34,200 feet, made at Mineola, Sept. 13. It also surpasses the unofficial record of Adjutant Casale, the French aviator, and tops the official world record of 28,900 feet accorded to Major Schroeder Sept. 13 by the American Flying Club.

Terrific Strain

Following his flight, Rohlfs declared that he was willing to rest on his laurels, so far as altitude flying is concerned. He said that the terrific strain is too much for him to continue.

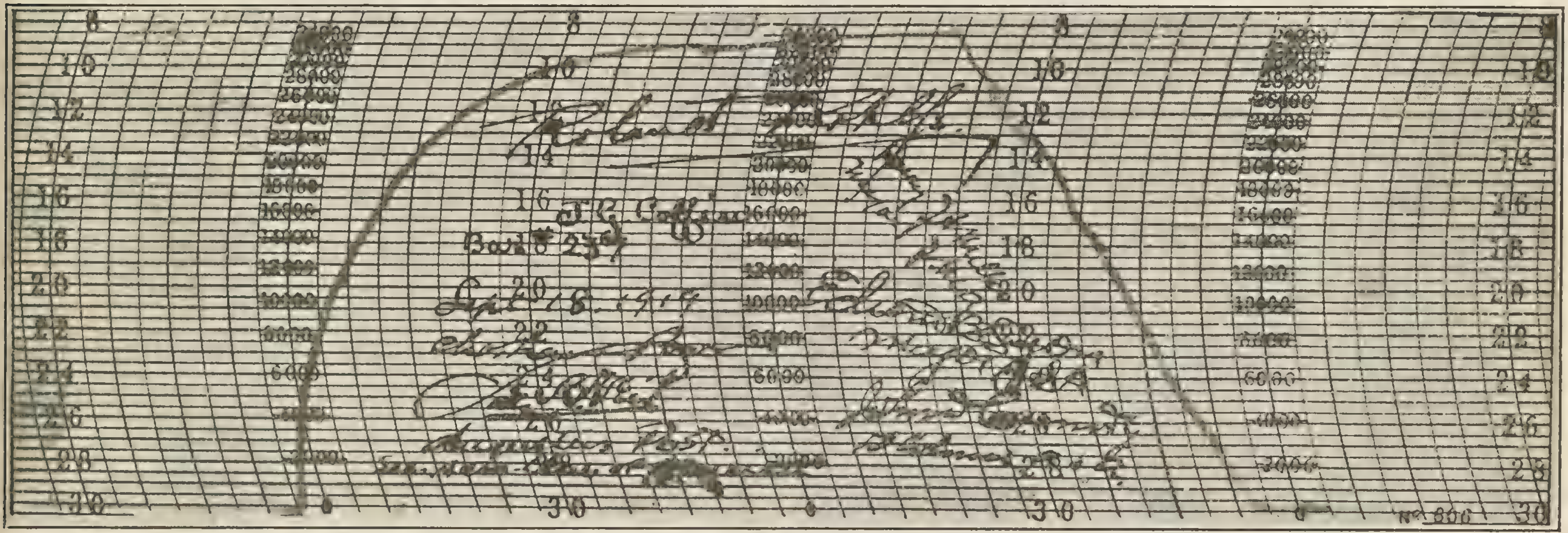
"I am through with high flying for the present," he said as he stepped from his machine, "and I am glad to be able to be down here and say it."

Rohlfs used the same machine Sept. 18 that he has gone up in on his previous flights, a Curtiss "Wasp" triplane, equipped with a Curtiss K-12, 400 h. p. engine, a machine designed during the war by the Curtiss Company as a fighting plane.

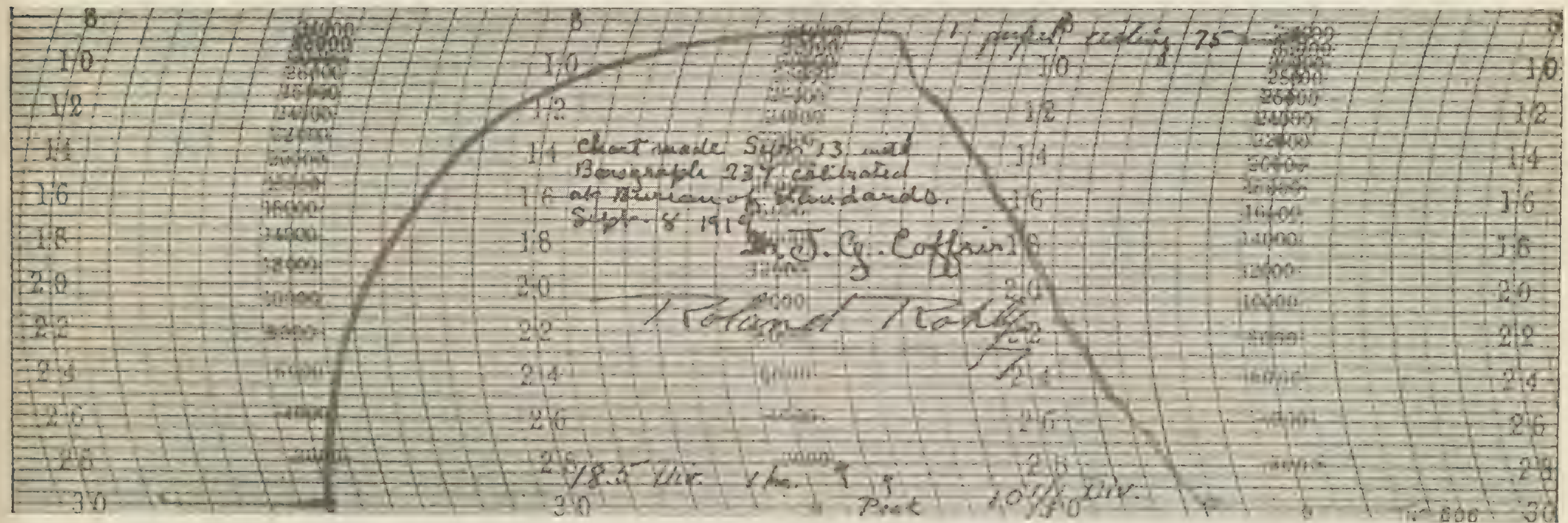
The official observers on Sept. 18 were: Augustus Post, Sidney D. Veit, Honorary Secretary of the Foreign Service Committee of the Aero Club of America; Prof. C. L. Poore, of Columbia University, representing the Aero Club of America; Col. John D. Carmody, Major Henry J. F. Miller and Major E. B. Lyons, representing the United States Army; Glenn H. Curtiss, President of the Curtiss Corporation; F. H. Russell, General Manager, and other representatives of the company.

Rohlfs's wearing apparel for his trip into the skies, where 40 degrees below zero prevails, consisted of three pairs of heavy woolen socks and a pair of hunting boots of sheepskin, wool inside. A pair of heavy woolen trousers and a heavy sweater over his woolen shirt also were worn be-

(*Continued on next page*)



Barograph of Rohlfs' Flight on Sept. 18—Sent to Washington to Be Calibrated



Barograph of Rohlfs' Flight on Sept. 13

Photo of barograph record of flight made by Roland Rohlfs, test pilot for the Curtiss Engineering Corp., on September 13, when he established a new record of 34,200 ft.

The curve shows the progress of the machine—a Curtiss "Wasp" triplane equipped with a Curtiss K-12 400 hp. motor—on its 6½ mile journey into the air. The first column of figures on the left indicates the barometric pressure which is at ground level 29, and which decreases with altitude. The second column indicates measurement in feet. The curve shows that Rohlfs made an almost perpendicular climb to 6000 ft., after which he "flattened" out his machine somewhat, reaching 23,000 ft. in 24 min. After reaching that point his climb was more gradual. It took him about 36 min. longer to reach 34,000 ft.—the maximum registration point on his barograph. At this point he continued for 7 min., and he estimated that he climbed an additional 200 ft.

The "peak" of his climb was reached in exactly one hour and a perfect ceiling in 75 min. On his descent he dropped 7000 ft. in five min. His time in reaching the ground was 40 min., or almost 1000 ft. a minute. Rohlfs estimated his speed at times as more than 250 m.p.h.

Roland Rohlfs' Altitude Record

(Continued from preceding page)

neath his flying suit of fur-lined leather. His head was protected by a chamois mask and a heavy leather helmet, goggles covering his eyes. His mouth was covered, except for a small aperture in his headgear, to admit a tube through which he could inhale oxygen from the supply he carried.

This latest record flight marked the fourth time that Rohlfs has ascended more than 30,000 ft. in the same machine since last July. In each flight he has used the same Curtiss "Wasp" triplane, fitted with a Curtiss K-12 400 hp. engine. The span of this machine is 32 ft. $\frac{1}{2}$ in.

One Hour Fifty-three Minutes

The entire flight consumed one hour and fifty-three minutes. It required seventy-eight minutes for him to reach his peak, and thirty-five minutes to come down.

He left the field at 12.06.30 and returned at 1.59.30. He had thirty gallons of gasolene in his tank when he went up and a few gallons left at the finish. The flight was made in remarkably fast time. The temperature at 34,610 feet was 43 degrees below zero.

"Well," said Rohlfs, as he stepped from the machine and doffed his helmet, "I did it this time. Everything was perfect. There is one thing about this flight, and that is that it was accomplished without the use of any super-charging device whatsoever. Ordinarily everyday gasolene was used, and the equipment was all standard equipment.

"Everything favored me. Wind, air, everything was just right, and I am glad that I was so lucky on my last attempt. The records appear to be perfect, and therefore I do not look for much of a change in the result after they have been calibrated in Washington."

The instruments used were a barograph which records, by means of a curve, the altitude and time, and a thermobarograph, which is used as a check.

Thin Air Spun Machine

"I made one interesting observation," said Rohlfs, "and that was that when about 31,000 feet up I struck very thin air. I could not keep my machine from going from one spin into another. It was terrible. I would pull over my controls and get the machine out of one only to find it dropping over the other way. Finally I realized that I did not have enough speed, and so I opened my throttle and regained the distance I had lost.

"Another thing was that, while I was greatly suffering from toothache and headache, I had a peculiar twitching in various parts of my body. I was burned once when a machine I was in caught fire in the air, and wherever scars were left I felt this nervous twitching.

"I believe that all official and unofficial records have been shattered. I am satisfied that this machine cannot be made to go any higher with its present equipment. I am through for the present with high flying. I am glad to be able to be down here to say it. It is tiresome work, and also work that is wearing on one.

"I reached the greatest altitude after climbing seventy-eight minutes, and maintained that altitude for about twenty minues.

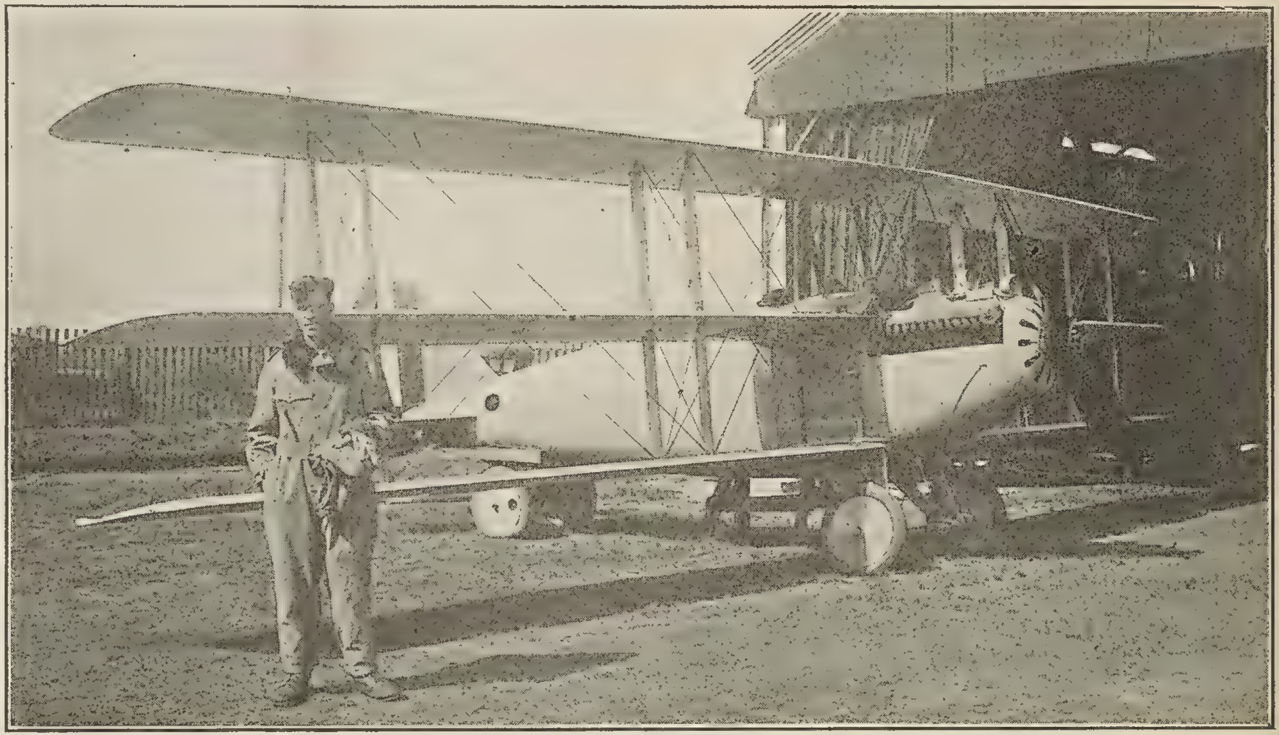
"My entire time in the air was an hour and fifty-three minutes. Nothing unusual happened to me, except a terrific oscillating movement of the machine when it turned over on its ear after dropping 600 feet.

"The temperature at the top of the climb was warmer by one degree than it was last time. To-day the temperature reached 43 degrees below zero.

"This time we saved about 100 pounds in weight. I had eleven gallons of gasolene too much last time. We took out the fire fighting apparatus this time, also the oil indicator and floor boards."

After the flight the barographs were officially observed and taken out of the cockpit of the machine by Dr. Frank Coffin, of the engineering department of the Curtiss Company. The instruments were then removed to the field headquarters where they were witnessed and attested to by the official observers and by Rohlfs.

On each of Rohlfs' flights he has landed back on the same field from which he started, demonstrating a wonderful sense of direction.



Roland Rohlfs and "The Wasp"

CURTISS OFFICIALS AT BUFFALO AERODROME

(Left to Right), F. R. Porter, Motor Engineer, Curtiss Aeroplane and Motor Corporation; J. A. Callahan, Factory Manager, Churchill Street Plant, Curtiss Aeroplane and Motor Corporation; C. M. Manly, Asst. Genl. Mgr. Curtiss Aeroplane and Motor Corporation; W. L. Gilmore, Vice-Prest. Curtiss Engineering Corporation; F. H. Russell, Vice-Prest. and Genl. Mgr. Curtiss Engineering Corporation

On Sept 19 Rohlfs in the same machine climbed 19,500 feet in 9 minutes, $42\frac{2}{5}$ seconds, thus establishing an altitude speed record. In the same model machine, at Dayton, Ohio, Rohlfs flew at a speed of 163 miles an hour.

Aviation Insurance

The development of aviation in this country has brought into the field a new phase of insurance. While it is in its early stage we cannot prevent loss of either life or property, but we can protect the investment. We, in the present day, will always be indebted to those who made possible the present conveniences of travel and instantaneous communication. All of us are not fitted to carry on these experiments. Realizing the value of aviation the insurance field is opening to make safe the capital placed to carry on this work and in this manner can do its part.

Aviators can collect the high rate of interest on their investment, and make it sound and safe as money in the bank by backing it with sound insurance. The far sighted man when his earning capacity is at its best sets aside part of his income for the future.

Airplane Mail to Cuba

Mail is to be carried by airplane between Cuba and the United States. Otto Praeger, Second Assistant Postmaster-General, who has charge of the air mail service, announced this Sept 19 as he sailed on the United Fruit liner *Zacapa* for Havana.

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Notes on Technical Aeronautics

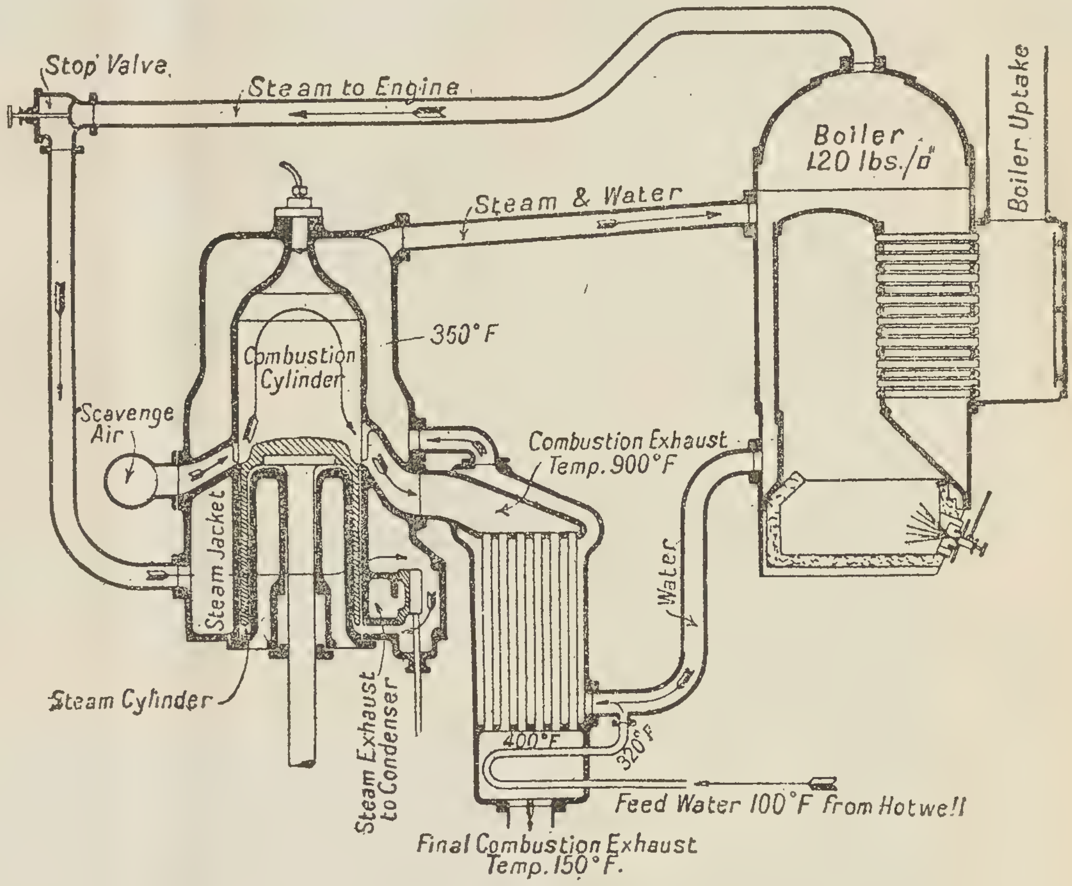
The Still Engine

The principles on which the Still engine works were explained in a paper before the Royal Society of Arts, by F. E. D. Acland, who also gave some of the experimental results obtained with gas, petrol, and heavy oil engines.

The author described the engine as being one capable of using in its main working cylinder any form of liquid or gaseous fuel hitherto employed, and making use of the recoverable heat which passes, through the surfaces of the combustion cylinder, as well as into the exhaust gases, for the evaporation of steam, which steam is expanded in the combustion cylinder itself on one side of the main piston, the combustion stroke acting on the other side. Its primary object is not to use the waste heat for raising steam, but first to use it in improving the thermal conditions of the working cylinder, and so insure the maximum efficiency from the fuel burnt within it, diminishing, as a consequence, the heat lost in that operation.

The jacket and cooling water form part of the circulating system of a steam generator, which may be an integral part of the engine, or external to it. The cooling water, therefore, enters and leaves the jacket at a constant temperature, regulated by the pressure of the steam; the cooling being effected by converting the water into steam without raising the temperature. Excluding the radiation losses, which are kept low by lagging, all the heat which passes through the walls is thus usefully recovered in the water as steam. The temperature of the cylinder wall is uniform over the whole of its exterior surface, and the heat lost to the cooling water at each stage of the cycle—compression, combustion and expansion—is diminished.

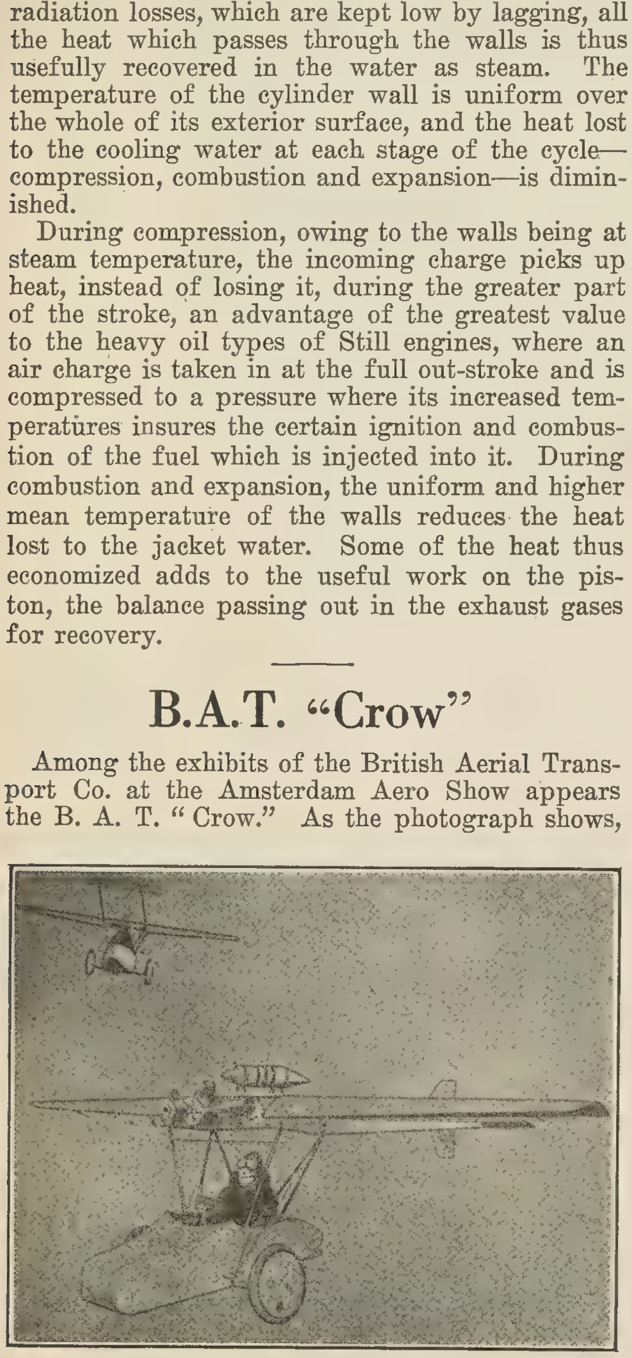
During compression, owing to the walls being at steam temperature, the incoming charge picks up heat, instead of losing it, during the greater part of the stroke, an advantage of the greatest value to the heavy oil types of Still engines, where an air charge is taken in at the full out-stroke and is compressed to a pressure where its increased temperatures insures the certain ignition and combustion of the fuel which is injected into it. During combustion and expansion, the uniform and higher mean temperature of the walls reduces the heat lost to the jacket water. Some of the heat thus economized adds to the useful work on the piston, the balance passing out in the exhaust gases for recovery.



THE STILL THERMAL CYCLE

B.A.T. "Crow"

Among the exhibits of the British Aerial Transport Co. at the Amsterdam Aero Show appears the B. A. T. "Crow." As the photograph shows, it is a monoplane of unique construction and a radical departure from conventional design. The "Crow" is one of the smallest airplanes in existence, and its novel design affords opportunity for extremely simple construction. With a spanner and a pair of pliers it can be dismantled in a few minutes; the main plane can be removed by releasing twelve nuts. Another interesting detail of construction is the lack of bracing wires which greatly facilitates rigging and dismantling.



B. A. T. "CROW"-TYPE F. K.-28

The little body for the pilot is built on a large central skid between the landing gear wheels. This position, below the wings, makes landing on any sort of ground comparatively easy. The long skid below the body prevents turning over on a bad landing.

The span is 15 feet, and the overall length 14 feet. The weight is 220 pounds. It is driven by a 40 horse-power A. B. C. "Gnat" engine, of the flat turn cylinder air cooled type. The motor is mounted on the front of the plane with the combined gasolene and oil tank above.

The tank capacity is 5 gallons of gasolene and ½ gallon of oil which is sufficient for nearly two hours' flight with a speed of approximately 75 miles per hour.

This type of machine is adaptable to many varied uses, especially for sport, traveling over wooded or swampy districts or general traveling in rural districts where roads offer the only landing place.—*London Aeronautics.*

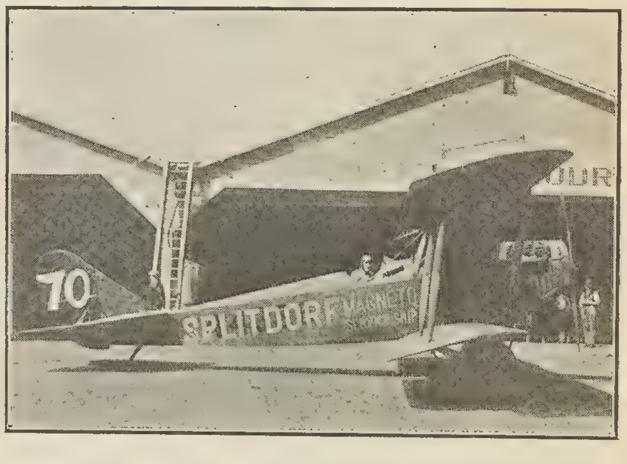
Magneto Supremacy

It is significant that the actual and nominal winners of the recent Toronto-New York airplane race piloted planes fitted with magnetos, and six out of seven of the prize winners depended solely upon the magneto for their excellent performance. Major Schroeder who piloted a VE-7 equipped with an Aero magneto received a rating of 107.8 per cent, and was the actual winner of the contest, though army rules did not permit of his accepting a money prize. However, H. R. Depew in a Curtiss JN-4, also Aero magneto equipped, was the nominal winner, which carried a price of $2,500.

Followers of flying are still talking about the remarkable performance of the winner of second place and a prize of $1,500. C. S. Jones in a JN-4 was originally a Splitdorf service pilot and was giving useful assistance to those pilots who needed it. This plane was a sort of general service plane, and was used for flying from place to place during the contest, helping the other flyers get ready for the start. Since the rules allowed it, and there was sufficient time, Jones decided to enter also, because his work of assistance had been finished.

The other four planes to capture money prizes also were fitted with Aero magnetos.

Like its performance oversea during the war the Splitdorf magneto showed its fitness and reliability by giving perfect ignition service on five planes which had a percentage of over 80. These were: Schroeder, VE-7, 107.8 per cent; Depew, JN-4, 106 per cent; Chandler, JN-4, 90.8 per cent; Taylor, JN-4, 96.8 per cent; Jones, JN-4, 82.3 per cent. Eight other planes which competed were equipped with Splitdorf Aero magnetos.



SPLITDORF PRIZE WINNING PLANE PILOTED BY C. S. JONES

Altitude Laboratory of the Bureau of Standards

Employed for the Purpose of Solving the Numerous Problems of Engine Performance

The altitude laboratory of the Bureau of Standards has been designed, built and employed for the solution of the numerous problems in engine performance—aside from general reliability and useful life, which can only be determined from statistics of performance of a large number of engines. In particular, the altitude laboratory has enabled the Bureau to do pioneer work in testing engines under the low pressures and temperatures of high altitudes, and it is the work of the laboratory which presents the most interesting features.

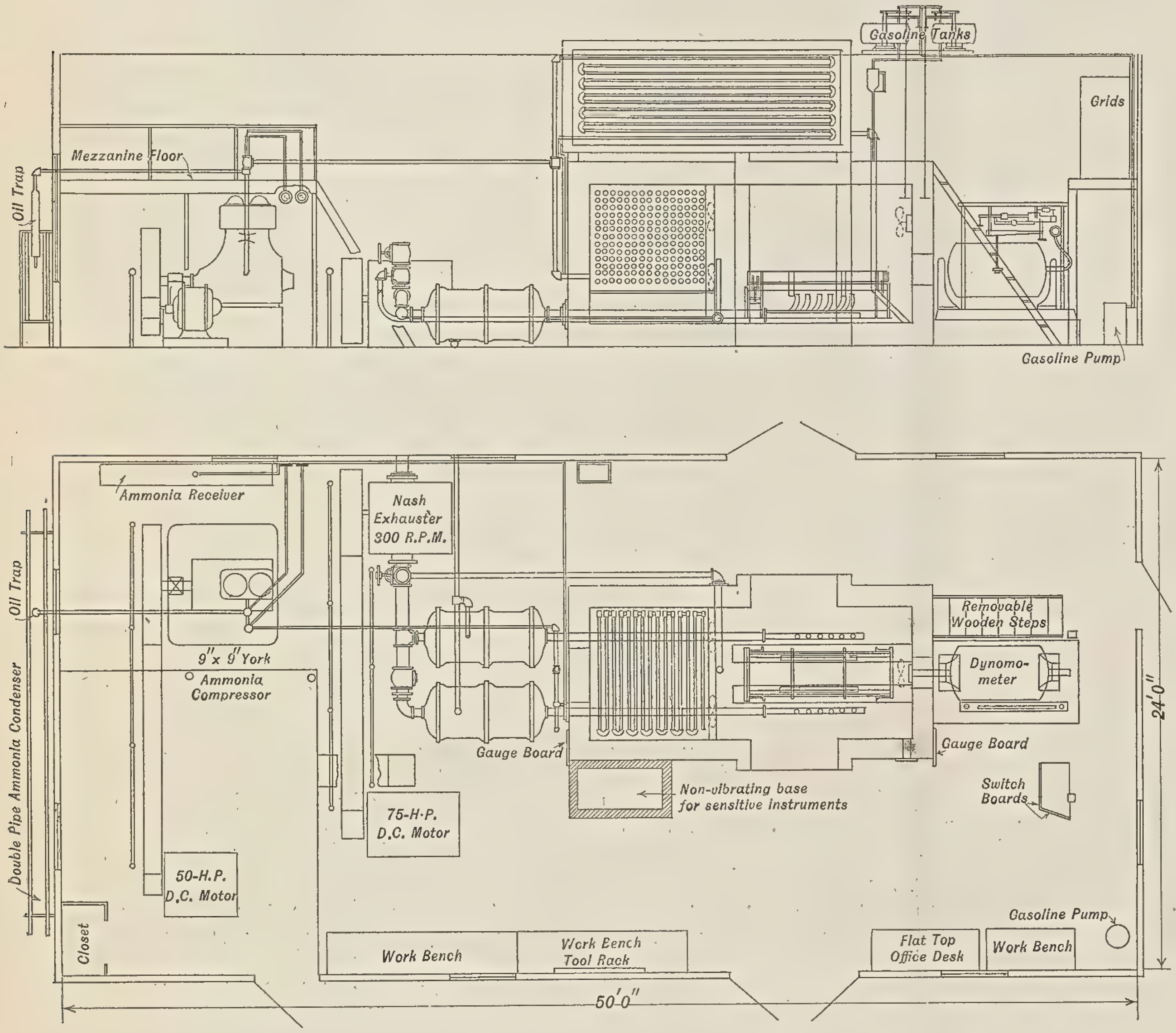


FIG. 1

The general arrangement of the complete building including the altitude chamber, benches, cooling apparatus and dynamometers is shown in Fig. 1.

The simulation of low pressures and temperatures is by no means a simple matter, however, and much skilful work has been done to secure this.

The altitude chamber is a concrete chamber 6 ft. 2 in. wide by 15 ft. long by 6 ft. 6 in. high, inside measurements. The walls of the chamber are 1 ft. thick, heavily reinforced with ¾ in. steel bars to withstand the pressure of the atmosphere outside the chamber. There are two doors opening on opposite sides of the chamber, 4 ft. by 6 ft. 6 in. in size, closing against heavy rubber gaskets, and of extremely heavy construction. The chamber is shown in Fig. 2.

The chamber may be considered as divided into two parts—the first containing the engine and the second, the cooling coils. The engine is mounted on a special stand at the right end of the chamber. Cables from the spark and throttle levers are led through holes in the wall. There are several other openings in the walls for various purposes, such as pressure control of the chamber, exhaust outlet from the engine, piping to the water jacket, gasoline inlet to carburetor, air inlet to carburetor, etc.

The refrigerating plant is installed in the left hand portion of the building. The ammonia compressor has a refrigerating capacity of 25 tons in 24 hours and was built by the York Manufacturing Co. It is belt-driven from a 50 hp. electric motor. The carburetor is cooled by a bank of ammonia coils, 2000 feet of 1¼ in. pipe, enclosed in a box and insulated with saw dust, and is mounted on the top of the altitude chamber. The air within the chamber is cooled by 800 feet of 1¼ in. ammonia coils. Circulation is maintained by the use of electric fans. With this system it is possible to reduce the conditions of the chamber to those up to about 30,000 or 40,000 feet altitude. This arrangement is shown in Fig. 3. The water jacket cooling system shown in Fig. 4 is installed above the chamber. It consists of a cylindrical iron tank to which the engine inlet and outlet pipes are connected. This tank is also connected to the city supply, and by means of a thermostatic rod cold water is admitted at intervals in order to keep the temperature at a certain point.

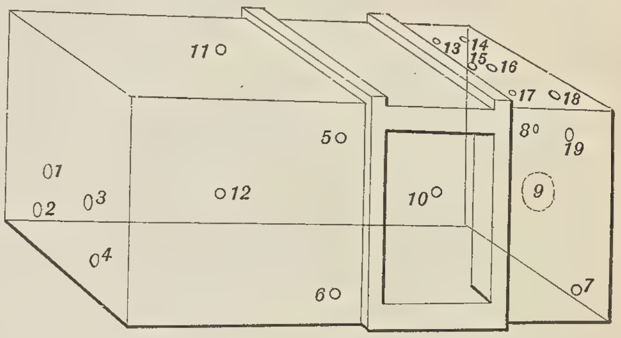


FIG. 2

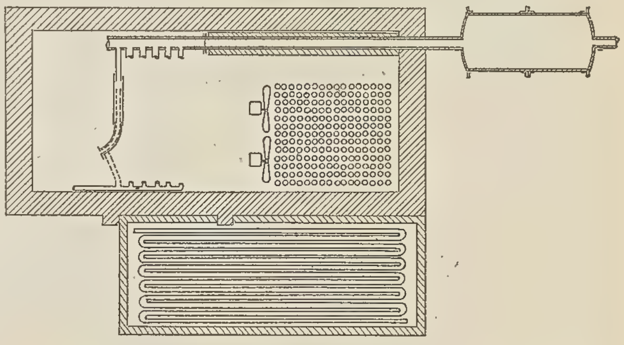


FIG. 3

The engine exhaust pipes are water jacketed, the inner pipe extending down about three feet from

(*Continued on page* 10)

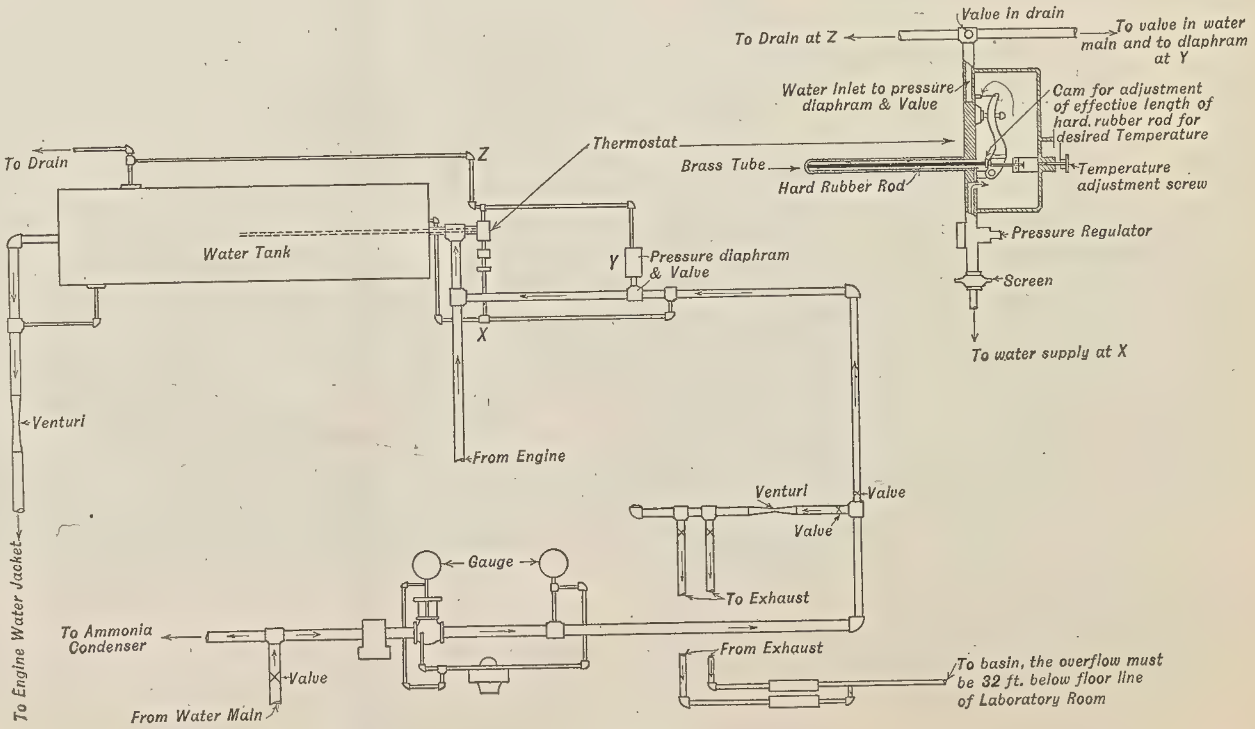

Valve in drain
To Drain at Z
To valve in water main and to diaphram at Y
Water Inlet to pressure diaphram & Valve
Cam for adjustment of effective length of hard. rubber rod for desired Temperature
Thermostat
Brass Tube
Hard Rubber Rod
Temperature adjustment screw
Pressure Regulator
Screen
To water supply at X
To Drain
Z
Water Tank
Y
Pressure diaphram & Valve
X
Venturi
From Engine
Venturi
Valve
Valve
Gauge
To Exhaust
To Ammonia Condenser
Valve
From Water Main
From Exhaust
To basin, the overflow must be 32 ft. below floor line of Laboratory Room
To Engine Water Jacket

FIG. 4

THE WORLD'S AIRPLANES AND SEAPLANES

Breguet Biplane Model B-14

Group 2, No. 4.—The Breguet Biplane Model B-14

The Breguet biplane B-14 was one of the best French machines of its type on the front. It was designed by M. Louis Breguet, a French electrical engineer, who experimented for several years in the possibility of the all-metal flying machine. The airplane under review is particularly interesting as it affords a good example of all-metal construction, based not on recent conceptions, but derived from methodical ivestigations procured through ten years of experimentation. The Breguet B-14 is a two-seater day-bomber, fighting and reconnaissance plane and is well adapted for these purposes.

POWER PLANT

12-cylinder V-type Renault motor.
300 hp. at 1500-1600 r.p.m.
Main fuel tank capacity (2 gravity tanks), 78.8 gals.
Auxiliary fuel tank capacity (2 tanks), 3 gals.
Oil tank capacity 4.75 gals.

MAIN DIMENSIONS

Span (upper plane) 47 ft. 3 in.
Span (lower plane) 45 ft. 2 in.
Chord (both wings) 74.8 in.
Overall length 29 ft. 9 in.
Overall height 11 ft. 6 in.
Dihedral angle (upper wing) 175 degrees.
Dihedral angle (lower wing) 0 degrees.
Negative stagger 8¼ inches.
Sweepback 175 degrees.
Area of upper wing with ailerons 294 sq. ft.
Area of lower wing 263 sq. ft.
Area of ailerons (2) 63.0 sq. ft.
Area of stabilizer 24.5 sq. ft.
Area of rudder 16.5 sq. ft.
Area of elevators (2) 35.6 sq. ft.
Area of fin 13.5 sq. ft.

MAIN WEIGHTS

Machine empty 2673 lbs.
Useful load 1131 lbs.
Maximum useful load 1351 lbs.
Weight of fuel and oil 475 lbs.
Weight of machine loaded (light) 4279 lbs.
Weight of machine loaded (heavy) 4499 lbs.
Wing loading (light) 7.68 lbs./sq. ft.
Power loading (light) 14.26 lbs./hp.

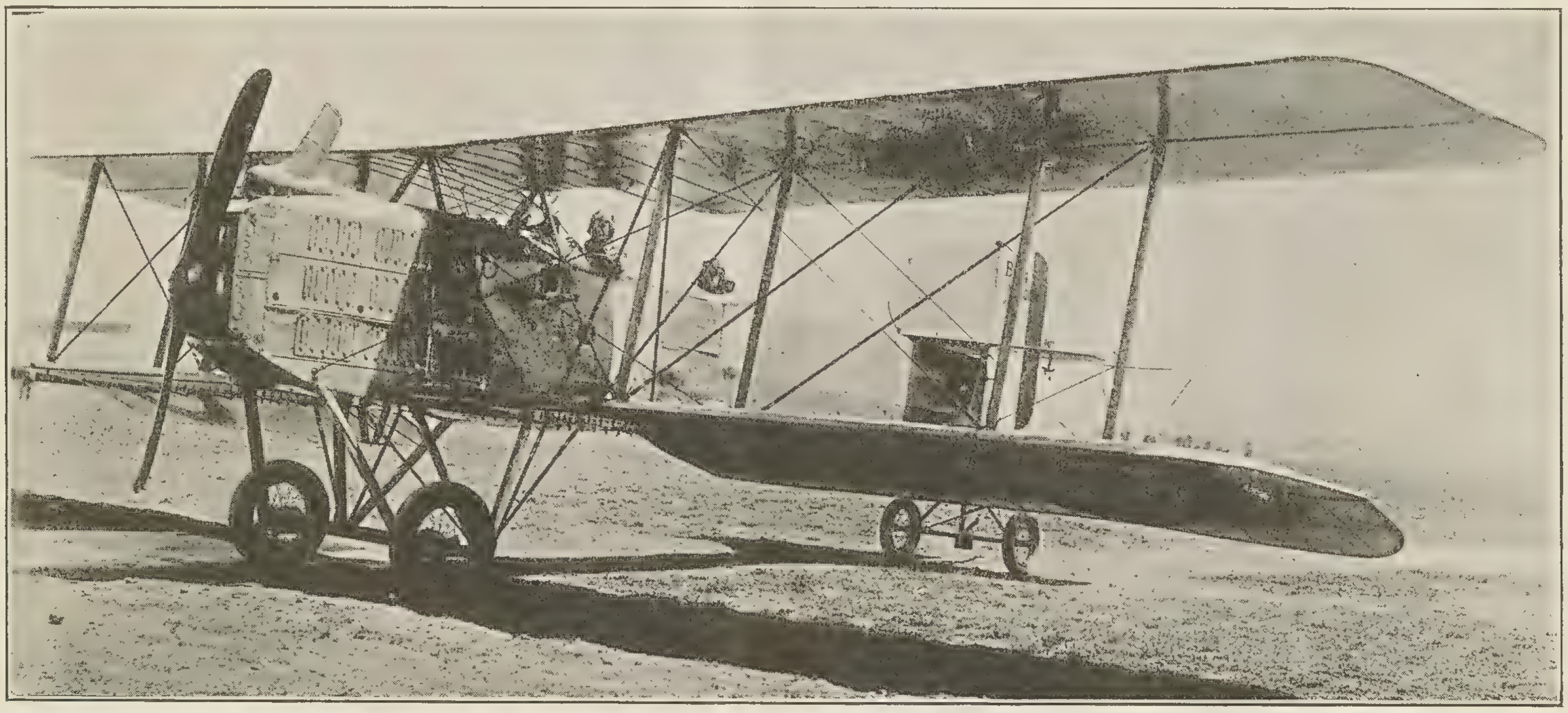
STRUCTURAL FEATURES

The most interesting feature of the Breguet B-14 is the wing construction. The wings have a negative stagger and both wings are "washed out"; the incidence of the upper decreases from 4.5 degrees at the body to 2.6 degrees at the tips, while the incidence of the lower decreases from 3 degrees to 2 degrees. The spars of both wings are drawn aluminum alloy tubes. The main ribs are spaced 13.7 in. apart and light false ribs occur between them. The webs of the main ribs are three-ply and the false ribs are thin strips of birch. The ailerons are balanced and appear on the upper wing only. On the lower wing the portion situated behind the rear spar is hinged along its entire length. The hinges are fitted to the upper face of the wing spar and to the top surface of the movable portion, and the latter is maintained at a given angle by the pull of twelve rubber cords, which are fixed to the underside of the ribs. The tension of the rubber cords can be adjusted by set screws. The object of this arrangement is to provide in flight for the automatic adjustment of the wing camber to the loading of the airplane.

The interplane struts are of aluminum alloy of stream-line section and are strengthened by steel channels, riveted to the sides of the struts.

The fuselage is built up almost entirely of aluminum alloy tubes which are joined through riveting by means of welded steel tube sleeves, and are spanned by wire. In the front part of the body steel tubes are used to carry the engine. The body is covered with canvas except around the motor where aluminum sheet is used. The tail planes are welded steel tubing and are covered with canvas. The elevator only is balanced. The landing gear consists of three pairs of struts, joined at the bottom on each side by a horizontal member to which the axle is fastened by means of a rubber cord shock absorber. The tail skid is ash and is provided at its lower end with leaf springs of steel. The bomb magazine is located in the middle of the lower wings and contains sixteen small bombs hung in two rows of eight parallel to the leading edge.

A fixed machine gun, for the pilot, is mounted outside of the body, to the left, and is operated by an interrupter gear from the motor camshaft.



Breguet Biplane B-14

Farmans in America

Henry and Maurice Farman, the airplane builders, are to establish an American sales branch. W. Wallace Kellett, who recently has been in France, has arrived in New York to open the agency of the big Billancourt firm.

Lieutenant Gaubert, one of the Farmans' most skillful and successful pilots, despite the fact that he has only one hand, will soon join Mr. Kellett, and a three-passenger machine of the "tour-about" type will be brought to New York for the purposes of demonstration. Other airplanes, including, it is expected, a Goliath, will be shipped across later. Ground will be obtained, probably on Long Island, for a Farman aviation field.

Mr. Kellett passed three months in investigating conditions in the United States before returning to France to make the report which Messrs. Henry and Maurice Farman had asked him to prepare. He is convinced that the time is ripe for opening the agency of a French aviation firm in New York.

"We shall soon see that aviation in the United States will receive a wonderful impetus from the war," says Mr. Kellett. "Enthusiasm over flying is now higher in America than ever before.

"We do not expect to manufacture airplanes in the United States, but before long we shall probably increase our activities to the extent of placing distributing agents at several important points in the country. At the aviation field which we shall establish we shall make it possible for a man to come to us, see a machine assembled and tested, and, if he makes a purchase, to fly away with it.

"The machines which we shall offer in America will not be of the military type. The military airplane is built for speed and ease of maneuvre. The airplane intended for civilian use is constructed with a view to safety and stability, above all. Obviously the demand in the United States at this time is for machines of the civilian type."

The growth of the Farman plant has been one of the big developments in the brief, but remarkable history of aviation. At the start of the war, in August, 1914, the company had 600 workmen, and was producing twenty-five machines a month. When the Armistice was signed it had about 7,000 workmen, and was producing 300 machines a month.

L. D. GARDNER. . *President and Editor*
W. D. MOFFAT. . . . . . *Vice-President*
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GEORGE NEWBOLD. . *Business Manager*
PETER VISCHER. . *Advertising Manager*

Formerly Air Service Journal

British Assumption

THE " Synopsis of British Air Effort During the War," put forward by the British Air Service and published as a Parliamentary paper in April, 1919, contains a rather remarkable statement with regard to the Liberty engine. This statement, under the heading " Assistance to the Allies," is as follows:

> " We have also supplied large numbers of aeroplanes of modern standard type, and when the question of producing a standardized engine was considered, every facility was given and all our experience placed at the disposal of the American Government, with the result that the Liberty engine was evolved."

That the British should assume any part in the production of the Liberty engine is so absurd that it only needs to be stated to show how broad some claims can be made. In the early stages of the design of the Liberty engine, the English were loud in their condemnation of the whole project, and, with one or two exceptions, every effort appears to have been made to discourage the plan. Later on when it was found that the engine could be used in airplanes and tanks, much assistance was given and many of the engines were desired. Secretary Baker stated in a public speech that he found that the English wished the engines so much that they would have traded anything they had for them—even the Houses of Parliament. But to try to make capital out of the production is too much to permit to go unchallenged.

Passenger Carrying Fuselage Design

AN interesting feature of commercial airplane design is the arrangement and location of the passenger carrying fuselage. So many commercial designs have been brought out both in this country and abroad that certain well defined tendencies already appear.

It would seem to be the consensus of opinion that the passenger containing fuselage should not be encumbered by the power plant and gasoline tanks. This leads immediately to the location of the passenger nacelle or fuselage in the center of the machine, with the power plant out on the wings, with the pilot and instrument board located in the nose of the passenger fuselage or nacelle.

But here arises a serious difficulty. The motors are so far from the dashboard that tachometer flexible shaft lengths become excessive, and beyond those which can be readily purchased; instrument leads, fuel and oil leads and connections become extremely complicated, and must be carried in some form of streamline covering. The mechanic cannot readily get at the motors, and has a dangerous walk out on the wings.

It would seem as if the next step would be to provide for the engines to be carried in nacelles on the wings, which would provide room enough for the mechanic and perhaps for the navigation man.

But the problems in the arrangement of the passenger fuselage do not end in the separation of the power plant. There is the fuselage itself to be considered. There seems to be no doubt at the present time, that for passenger carrying this should be totally enclosed. One never connects the airplane with ventilation requirements. Nevertheless it would seem as if proper ventilation must really be provided for, to the right degree. Since it is not an invitation to passenger riding to be enclosed in a clumsy, electrically heated suit, the entire cabin should be suitably heated. Seating arrangements follow fairly obvious lines, yet a good deal of ingenuity still remains to be displayed in the arrangement of windows for perfect vision, for impromptu meals and so forth.

Next the commercial cabin must be easy of access. The De H 10A which had its central fuselage within a couple of feet of the ground would provide easy access for passengers, granted a suitable door, and in an English commercial machine a similar construction has been embodied. The installation of doors also is an interesting problem if structural strength is not to be interfered with.

There would seem to be here a promising and interesting field.

Significance of Altitude Records

ON July 30th Ronald Rohlfs attained an altitude of 30,700 feet in a Curtiss Wasp Triplane equipped with a Curtiss K-12 400 h.p. engine. A few days back, the same pilot achieved an altitude of about 34,000 feet, with comparatively slight physical discomfort, thanks to oxygen tanks and heated clothing.

Further, on Sept. 18, Rohlfs climbed to an altitude of 34,610 feet, a world's record.

We are inclined to think that there are real possibilities ahead in altitude work. These altitude flights have demonstrated that a pilot in an open cock-pit, with a machine provided with suitable equipment, but not otherwise specially arranged for high altitudes, can navigate successfully. With a machine specially built for the purpose there is no reason to doubt that both pilot and passengers could be adequately protected, and a sustained flight of many hours' duration be quite possible at an altitude of 30,000 feet.

At this altitude, the airplane would be free of storms, fog, rain or snow. Given suitable navigational facilities, and a reliable motor, travel would become absolutely safe and devoid of uncertainty.

There is, however, the question of speed and efficiency. Here that most important development, the turbo-compressor, will come to our help. Maintaining the engine-power constant at altitude, it will enable to fly at enormously greater speeds for the same expenditure of power.

Flight at altitudes of 30,000 feet or higher—with full comfort, commercial speeds of 200 miles per hour, perfect safety at least while the plane is in the higher atmosphere, these are indeed wonderful to contemplate.

Commercial Helium

DISCUSSING the subject of commercial helium, with production cost at 10 cents per cubic foot, *Aircraft* (London) says:

> " In a four days' voyage a great quantity of helium would be dissipated, assuming that the rate of diffusion through fabric is only half that of hydrogen (the usual calculation), and that the loss through the valves follows the same proportion. The latter part of the estimate is open to obvious comment, but let it stand in a comparison with the approximate loss of hydrogen in any voyage made by an airship. Make a more drastic cut in the figures by reckoning the escape of helium at only 25 per cent. that of hydrogen, and apply the result to the profit and loss account of any American airship that is practicable to-day. A debit would almost certainly appear in connection with a cargo load of 30, 60, or 100 tons, after running costs and depreciation charges are duly entered. The prime necessity in this case is cheaper gas, not a dearer sort. If we can obtain the former then we shall be so much nearer to the great end in view."

News of the Army and Navy Air Services

Money for Air Service

Senator Wadsworth bill (S 2924) to amend "An Act making appropriations for the support of the Army for the fiscal year ending June 30, 1920, and for other purposes," approved July 11, 1919, has been read twice and referred to the Committee on Military Affairs. The amendment makes these provisions for completing the Air Service:

"For hangars for storage at Aviation General Supply Depot at Fairfield, Ohio, $5,500.

"For hangars for storage at Aviation General Supply Depot at San Antonio, Texas, $23,000.

"For completion of barracks and quarters at Fords Island, Hawaii, $35,000.

"For construction of sewer system at Arcadia Balloon School, Los Angeles, Cal., $1,500.

"For general construction at Selfridge Field, Mount Clemens, Mich., $35,000.

"For the purchase of real estate as follows:

"For Aviation General Supply Depot, Richmond, Va., $5,100.

"For Ellington Field, Houston, Texas, $40,642.

"For Chanute Field, Rantoul, Ill., $208,000.

"For Park Field, Memphis, Tenn., $88,400.

"For Mather Field, Sacramento, Cal., $78,673.

"For Chapman Field, Miami, Fla., $71,500.

"For March Field, Riverside, Cal., $64,000.

"For Brooks Field, San Antonio, Texas, $140,446.

"For Kelly Field, No. 2, San Antonio, Texas, $349,686.33.

"For Scott Field right of way, Belleville, Ill., $100.

"For Aviation General Supply Depot, Middletown, Pa., $50,000.

"For Aviation General Supply Depot, Little Rock, Ark., $55,000.

"For Arcadia Balloon School, Los Angeles, Cal., $55,655.

"For Selfridge Field, Mount Clemens, Mich., $190,000.

"Total for Air Service, $1,497,202.33."

Ensign Wood Married

Ensign Arthur Raymond Wood, of the NC-4 on its transatlantic flight last May, was married Sept. 16 to Miss Louise M. Magnolia, of Belle Harbor, in the Church of St. Francis de Sales at Rockaway Beach, L. I., by the Rev. James M. Foran. After spending a few days in the Berkshires Ensign Wood and his bride will leave for Tacoma, Wash., where they will remain a year, then return to New York to live.

Itinerary of the NC-4

The itinerary of the NC-4 in her recruiting tour along the Atlantic Coast is: Portland, Me., September 25; Boston, September 27; Providence, October 1; New Haven, October 3; Philadelphia, October 6; Baltimore, October 11; Washington, October 15; Norfolk, October 19; Charleston, October 23; Jacksonville, October 27; Miami, October 30; Pensacola, November 3; New Orleans, November 4.

Honorably Discharged

The following officers have been honorably discharged from the service of the United States:

Gorman DeFreest Larner, Captain, A.S.A.
Wm. A. Morgan, Jr., 1st Lieut., A.S.A.
Felix R. Roche, 1st Lieut., A.S.A.
Joseph F. Randall, Captain, A.S.A.
Henry K. Gibson, Captain, A.S.A.
Fred F. Nolde, 1st Lieut., A.S.A.
Homer G. Jordan, 2d Lieut., A.S.A.

Finlay to Pilot the White

Lieut. William Finlay, former bombing pilot in the American Air Service, has been selected to pilot the trans-Pacific White Monoplane when it starts on its record-breaking voyage.

Lieutenant Finlay has flown American and foreign bombing planes of large size extensively, and is thoroughly competent to handle the 82-foot monoplane.

Lieut. William Finlay

He served as bombing instructor at Ellington Field for nearly two years, and has flown approximately 400 hours on Curtiss, De Haviland, and Handley Pages. He has the remarkable record of having never crashed with any machine.

Construction of the trans-Pacific plane is being rushed as rapidly as possible, but not fast enough to suit Lieutenant Finlay, who is impatient to hop off on the long flight. In his opinion the feat is easy.

George D. White, designer of the monoplane and himself a pilot, will probably serve as relief pilot over the long stretches. Both pilots are experienced motor mechanics, and Lieutenant Finlay is especially experienced on Hispano-Suiza motors, preferring these to all others.

New R. M. A.'S

The following officers having completed the required number of tests are hereby rated as Reserve Military Aviators, to date set after their respective names:

2d Lieut. Ervin Brockman, A.S.A., Aug. 9, 1919.
Capt. John G. Ayling, A.S.A., June 7, 1919.

Not to Fly the Pacific

Lieut.-Comdr. Albert C. Read declares that there is no truth in the report he is to fly across the Pacific in a naval seaplane. He made this declaration at a luncheon at the American Flying Club.

D. S. C. for Lieut. Waring

The Commander-in-Chief, in the name of the President, has awarded the Distinguished Service Cross to First Lieut. William W. Waring, pilot, Eleventh Aero Service Squadron, for extraordinary heroism in action near Dun-sur-Meuse, France, September 26, 1918. Deeming it impossible to catch their own formation Lieutenant Waring, with Lieutenant Sigbert Norris, Observer, attached themselves to a formation from the Twentieth Squadron and engaged in a thirty-five-minute fight with thirty enemy aircraft. Five of this squadron were lost, and the observer of one of three remaining planes seriously wounded. The wounded man had fallen in a position which made the control of the machine difficult. Lieutenant Waring immediately placed his machine between the enemy formation and the crippled companion in order to protect it, and continued to fly in this place until our lines were crossed and the enemy scouts driven off.

Home address: Mrs. Lucy T. Waring, mother, Franklinville, N. Y.

Air and Under Sea Talk

An American hydroplane, 2,000 feet up, talked recently with a submerged submarine at Fisher's Island, six miles from New London Harbor. The conversation from both plane and submarine was listened to by a party of 250 engineers, members of the Edison Society of Electrical Engineers meeting at New London.

As guests of Capt. J. R. De Frees, commander of the experimental station, about one hundred of the engineers boarded the destroyer Blakeslee, while others boarded a subchaser. The submarine N-6 dived several fathoms, and the water craft established both wireless and wireless telephone communication with her. At the same time a hydroplane established radio communication with the surface craft and with the submarine. The conversations were plainly heard by the engineers aboard the surface craft.

The system of radio communication through both air and water was worked out at the local station, and will be made a part of the regular naval equipment when final tests are made. The system enables an airplane, which can see submerged submarines, to direct a friendly submarine in the accurate firing of a torpedo at the enemy submersible.

Where Not to Land

Col. R. S. Hartz, who is flying in a U. S. Martin Bomber, over the states of Wisconsin, Illinois, etc., has notified the Office of the Director of Air Service that the city of Milwaukee, Wis., does not wish Air Service pilots flying over that city to land in Washington Park.

Colonel Hartz reports a flight from Chicago to Milwaukee, flying at a maximum altitude of 3500 feet. He states that there are good fields all the way about four miles from the lake. He also reports Illinois aero field in excellent condition.

Magneto Ignition

A booklet issued by the Sims Magneto Co. points out "Why Magneto Ignition Makes a Good Engine Better." The booklet says:

"The Magneto is truly economical because it saves fuel, gives more power, and requires less attention. Lower operating cost in a short time more than offsets the higher first cost of the magneto."

Bureau of Standards Altitude Laboratory

(*Continued from page 6*)

the exhaust port, while the outer pipe is continuous from the exhaust port to the exhaust manifold in the form of a flexible tube. The mixture of water and gases passes through two five inch pipes to the auxiliary exhaust tanks, Figure 2, where the water is drained off and the gases pass to the exhauster. The exhauster is a Nash "Hydroturbine" type and by this means the barometric pressure on the exhaust and within the chamber are kept approximately equal.

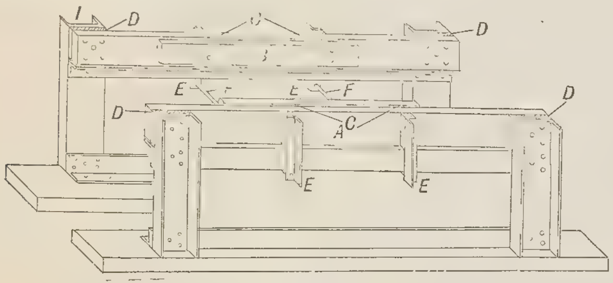


Fig. 5

The dynamometer is connected to the engine through a flexible coupling. This dynamometer was built by Spragur and has a rated capacity of 300 hp. For higher horsepower it is used in conjunction with a specially designed water brake.

The engine support is clearly shown in Fig. 5. It is constructed of channel iron riveted at the joints; the beams which support the motor are wood and can be replaced for different motors.

All of the measuring instruments are conveniently assembled on two small boards, so that one man can control the entire plant at all times. Two means have been used to measure the amount of air flowing to the carburetor—a Thomas meter and a venturi tube. The Thomas meter uses resistance thermometers at the inlet and outlet sides of a grid of resistance mine is used to heat the air. It measures the watts input for a constant temperature rise of the air passing through the grid. By this means the velocity of the air can be computed.

The fuel used by the engine may be measured in either of two ways: by means of an accurately calibrated tank or by two tanks mounted on platform scales. Underground tanks are provided for the storage of fuel while the measuring tanks are mounted above the chamber.

Connections are made so that samples of the exhaust gases can be obtained from the engine for analysis. The laboratory is well supplied with the necessary tools and work benches so that minor repairs and adjustments can be made without outside assistance.

Work on the laboratory was begun in August 1917, and the first test was run on a Liberty "8" in December, 1917. Since that time about 175 complete altitude "flights" have been made, comprising only a little less than 1000 hours of actual engine operation.

Aeronautical Course

Beginning October 2, a series of evening lectures on the theory and practice of Aeronautical Engineering will be delivered at the Brooklyn Polytechnic Institute by Alexander Klemin, consulting aeronautical engineer. These lectures will deal with the fundamental principles of aeronautics, to be followed by the practical application of the principles to airplane construction and design.

This course should be of interest to airplane draftsmen and to others in the industry.

For further particulars, apply to the Director of the Evening School, Brooklyn Polytechnic Institute, Brooklyn, N. Y.

"The Slipstream"

The Aircraft Journal has received a very interesting publication from McCook Field termed "The Slipstream," which deals in humorous style with matters at the field. The publication is well edited and printed.

Transcontinental Derby

The First Trans-Continental Aerial Derby to be held under the auspices of the Aerial League of America, on the sanction of the Aero Club of America, as provided for under the rules of the International Aeronautic Federation, has been officially announced.

The announced purposes of the Derby are:

(1) To establish and open the first trans-Continental airway by first establishing landing places at every fifty miles across the Continent, from Coast to Coast, and then give inducements to aviators to fly over the airway, landing on the established landing places. It is hoped that this Derby and the Aerial Tours that will follow will lead to the establishing of permanent air lines across the Continent for carrying mail, passengers and express.

(2) To foster the design and construction of efficient airplanes with a view to maximum speed and greater safety of air travel.

(3) To test the reliability and economy of existing airplane engines.

(4) To bring about increased efficiency in the design of airplanes especially fitted for the transportation of passengers, mail and express.

(5) To foster the practice of flying by chart and compass and navigating the air entirely by the use of instruments.

(6) The airplanes entered to be equipped with self-starters and mufflers, which will afford an extensive test and bring about maximum improvement in these very important devices.

CLASSES OF ENTRIES

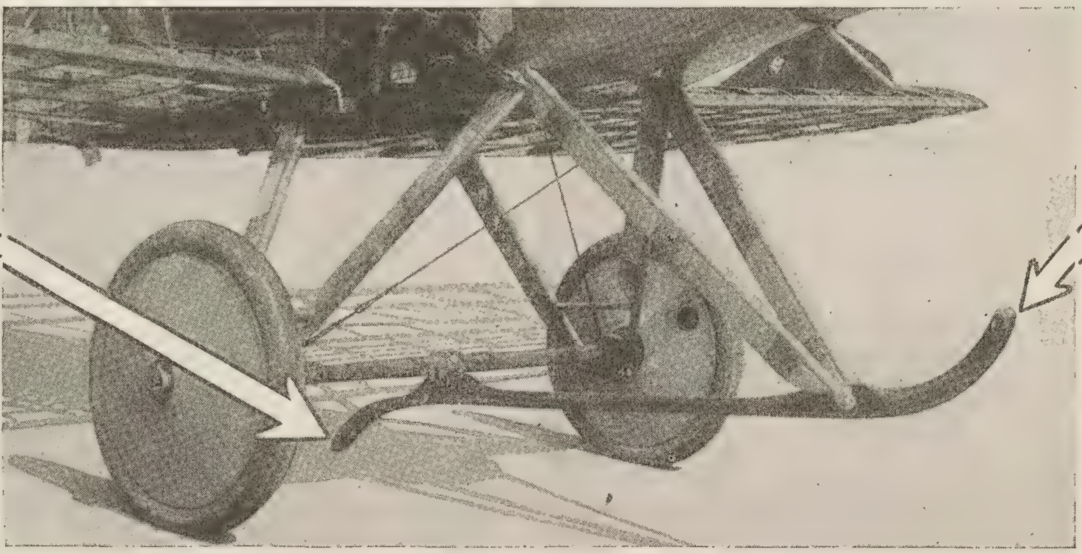
(1) Single-motored airplanes of any horse power, touring, pleasure and limited to transport cases, with suitable cabin for the protection of passengers when three or more passengers are carried.

(2) Multi-motored airplanes of any horse power, with suitable cabin for the protection of passengers against the elements and waterproof and fireproof containers for mail and express carried.

THE ACE Price $2500

With a Most Efficient Undercarriage

The TAIL
OF
The SKID
acts as a brake when Landing and is an aid in Taxying



The NOSE
OF
The SKID
prevents nosing-over when Taxying, Taking-Off or Landing

Safety First is demanded by Commercial Aviation.
Even before Taking-off and upon Landing, a short roll is most essential.
The ACE will Taxy easier and come to a Stop quicker than any other Airplane.

C. M. Swift,
Gen. Mgr.
N. W. Dalton,
Chf. Engr.
Horace Keane,
Sales Mgr.

Ask the MAN who Flies one
AIRCRAFT ENGINEERING CORPORATION
Sales Offices: 220 West 42nd St., New York
The ACE Flying Field, Central Park, L. I. Send for Booklet A. J.

General Offices
2 East End Ave., N. Y.
Factory A
535-7 East 79th Street
Factory M
417-9 East 93rd Street

Aeronautic News From Three Continents

Swiss Alps Offer Unexcelled Beauties for Air Tourists
Australia Making Rapid Strides in Commercial Aviation

Planing in Switzerland

With the coming of peace the progressive spirit of the Swiss has been remarkably displayed in the field of aviation. Three corporations have been organized who vie with each other in the promotion of travel by air. One of these companies, the "Aero," has actually established a regular bi-weekly passenger service.

The first Alpine flying field has just been completed at Montana, Switzerland, 5,000 feet altitude, in the beautiful canton of Valais. Regular flights are undertaken around the Matterhorn, the King of the Valaisan mountains, and other peaks, affording air traveler marvelous views of Alpine scenery.

A regular service has also been established between Zürich and the fashionable resorts of the Engadine, especially St. Moritz. Aerial trips are also arranged from the aviation field, Samaden, upper Engadine, into the Bernina mountain group and vicinity.

WHAT THE BERNESE ALPS LOOK LIKE FROM AN AIRPLANE
(c) *Aéro, Zurich*

Advertising Oils

S. E. J. Cox of Dallas, Texas, is the first oil promoter to use airplanes in advertising oils. He has purchased a Curtiss JN, which he is using in traveling to his various oil wells and refineries. He recently made a trip of 1400 miles in the machine, going from Dallas to Big Springs, Texas, and from there to Wichita, Kansas, and return. Mr. Cox recently purchased a Curtiss Oriole, which he will use for his own travel.

Hangar in Cellar

A hangar for the family airplane in the basement is a feature of the easy-to-keep house plan which was shown at the Own Your Home Exhibition in New York this month.

Australian Aeronautics

Australia has noted with interest the development of commercial aeronautics in the countries of Europe and throughout the United States, and, feeling that success is assured, has decided to establish a department of her own. For this purpose an initial appropriation of $1,500,000 has been made by the Government, and the assurance has been given that more funds will be supplied when the feasibility of commercial aviation in Australia is established. The present appropriation will be used alone.

In returned war aviators Australia has the nucleus for a training corps, for these men are ready to serve their country. They will be asked to assist and direct the construction of the merchant air fleet and to instruct the pilots and observers. The argument is advanced that the returned war fliers will obtain employment in this manner and at a rate of remuneration higher than in other commercial pursuits.

The transport of mail by airplane in the United States has been noted here, and the backers of the new movement assert that results in Australia will be greater than in America. In the United States, they point out, there is an excellent system of railroads and the transportation of mails always is speedy, but the aero delivery is faster. In Australia the railroad system is not so good, and the chances for the aero post to better the work of the railroads is infinitely better.

Transportation of passengers in countries of Europe also has been the object of interest in Australia, and the same argument is advanced that if it is a success there it cannot fail here. Later freight transportation will be taken up, provided, of course, that air delivery of mail and transportation of passengers proves successful.

At present the Government is the only organization interested in the development of commercial aviation here, but later it is expected that private capital will be attracted and that Australia will develop a system of aerial transportation.

May Fly to Pole

Bound for the North Pole, Roald Amundsen, Norwegian discoverer of the South Pole, is at present drifting in his ice locked schooner, the Maud, somewhere north of western Siberia, according to beliefs held by the Seattle Norwegian Vice Consulate and Vilhjalmur Stefansson, Canadian Arctic explorer.

In planning the trip the explorer said he expected after reaching the pole to return either to Grant Land, west of Greenland, or Melville Island, which lies in the Arctic Ocean north of Canada. Should he reach Melville Island he probably would journey by sea to Nome, Alaska, or overland to Dawson, Yukon Territory.

Two airplanes, it is believed, formed part of the Maud's equipment when she left Norway last fall and sailed through the White Sea bound for the icy north. The final dash to the pole may be made in one of the planes. Amundsen, it is believed, may also fly back to civilization in one of the machines.

Nothing has been heard from Amundsen since September 1, 1918, nearly one year ago. At that time the Maud was reported taking oil for her motors at Dixson Island, a White Sea point. After taking the oil she sailed northeast into the rapidly freezing waters of the Arctic Ocean.

From the White Sea Amundsen expects to drift east with the ice to the New Siberian Islands, which lie in the Arctic off Siberia. At the New Siberian Islands, it was believed, the drift would carry the boat toward, if not across, the pole. Amundsen intended to use the airplanes if he found the drift would not carry him across the "top of the earth."

Amundsen in a degree followed the footsteps of his countryman, Fridtjof Nansen. In 1895-1896 Nansen in the Fram started on a drift across the pole, but left his boat and tried unsuccessfully to reach the goal on foot. Later the Fram drifted as close to the pole as Nansen got.

The Maud carries wireless sending apparatus but no receiving instruments. Amundsen said he would not install the receiving apparatus because he did not want to be worried by news from the outside world.

The Norwegian Government this summer arranged to establish several food depots on Grant Land, from Cape Columbus to Robinson Channel, for the use of Amundsen in case he comes out by his eastern route. If he comes toward the west and strikes Melville Island he will find himself on familiar ground, for he passed near Melville Island when he discovered the Northwest Passage in 1903-1906.

Souvenir Stamp Sold

Lieut. Colonel Halford of the Air Ministry paid $1,050 at auction last week for a stamp souvenir of Harry G. Hawker's attempted transatlantic flight. The stamp, inclosed in an album, bears the signatures of all the famous Atlantic fliers and is initialed on the back by the Postmaster General of Newfoundland, Sir John Alcock, Sir A. Whitten Brown and Harry G. Hawker.

Catching Criminals

What is probably the first use in Europe of an airplane in the detection and apprehension of criminals has just been reported from Capri, Italy. An Englishman named Green was suspected of running his villa as a baccarat gambling den. After spying round the place, a Naples police inspector secured a seaplane and made a night flight to the grounds of the villa, where he captured an aristocratic party at play.

Peace Treaty Convention Relating to Aeronautics

Annexes F and G to " Convention Relating to Air Navigation "—Concluded in an Early Issue

Annex F

INTERNATIONAL AERONAUTICAL MAPS AND GROUND MARKINGS

International maps shall be made and ground marks established in accordance with the following general principles:

I

Maps

1. Two types of aeronautical maps shall be used. They are hereafter mentioned as *general* maps and *local* maps.

2. The index scheme for the aeronautical maps, both general and local, shall be based on the index scheme adopted for the " International 1:1,000,000 scale map " by the official International Congress convened for the purpose in London in 1909 and in Paris in 1913.

NOTE.—Extract from the resolutions adopted by the Conferences at London and Paris.

The sheets of the international 1:1,000,000 scale map shall include 6 degrees of longitude and 4 degrees of latitude. The limiting meridians of the sheets shall be at successive intervals, reckoning from Greenwich, of 6 degrees; and the limiting parallels, reckoning from Equator, shall be at successive intervals of 4 degrees.

The longitudinal sectors, from longitude 180 degrees E. or W. of Greenwich, are given numbers from 1 to 60, increasing in an easterly direction.

The 22 zones, of 4 degrees in depth, extending from the Equator on each side to 88 degrees latitude, are given letters from A to V.

The polar areas, extending for 2 degrees, are lettered Z.

In the northen hemisphere, each sheet shall bear a descriptive symbol composed of the letter N—followed by the zone letter and sector number corresponding to its position, thus: N.K.-12.

In the southern hemisphere, the letter S shall replace the letter N. Example: S.L.-28.

3. The metre shall be used as the standard of measurement for lengths, distances, heights, and depths, reserving for each nation the right to add figures expressing these quantities in its own units.

4. The colors, symbols and arrangements for production adopted for the International 1:1,000,000 scale map shall be used as far as practicable on the aeronautical maps.

5. The general maps shall be drawn on Mercator's projection and shall be to a scale of one degree of longitude equals three centimetres. The general maps shall have marked on them in fine lines the meridians and parallels of each degree and the meridians and parallels limiting the unit sections of the 1:1,000,000 map shall be accentuated. The same designation of unit sections shall be used as for the 1:1,000,000 map.

6. Each general (Mercator) map shall bear the French heading *Carte Generale Aeronautique Internationale* (see the conventional sign plate figure 1), and under it a translation of this heading in the language of the country publishing the map. It shall also bear an appropriate geographical name.

Each sheet shall show at least the following: principal physical features and geographical names, wireless stations, marine light houses (height and range at sea level, color and character of the light); national frontiers, prohibited areas, principal air routes, lines of equal magnetic variation, South Polar distance, latitude, old and new rotation of longitude (see paragraph 7), with an outer margin containing letters and numbers referring to the index of the 1:1,000.-000 map, legend of symbols in English or French and in the language of the country publishing the maps, publisher's name and date of publication and of successive editions.

7. The local maps shall be drawn to a scale of 1:200,000.

NOTE.—For local aeronautical maps of sparsely inhabited countries, the scale of 1:500,000 or 1:1,000,-000, as appropriate, may be used.

In addition to the customary latitude and longitude notations, the local aeronautical maps shall bear numbers enclosed in rectangles, corresponding to a new system of co-ordinate reckoning based on the anti-meridian of Greenwich and the South Pole. The new *grid* reckoning, with regard to latitude, shall commence with the South Pole as zero and increase northward by degrees and minutes to 180 degrees at the North Pole, and with regard to longitude shall commence with the anti-meridian of Greenwich as zero and run eastward by degrees and minutes to 360 degrees.

8. Each unit sheet of the local aeronautical maps shall bear the French heading *Carte Normale Aéronautique Internationale* (see the conventional sign plate figure 2), and under it a translation of this heading in the language of the country publishing the map. It shall comprise one degree of latitude and one degree of longitude and shall be designated by a locality name and by the new co-ordinates (described in paragraph 7) of the southwest corner of the sheet, the unit diigts being accentuated. In these designating co-ordinates, the figures referring to the South Polar distance shall invariably be written first.

EXAMPLES: The sheet whose southern boundary is 49 degrees N. (*i. e.*, 139 degrees South Polar distance) and western boundary 2 degrees E. (*i. e.*, 182 degrees from the anti-meridian of Greenwich) will be numbered 139-182.

Or the sheet whose southern boundary is 36 degrees S. (*i. e.*, 54 degrees South Polar distance) and western boundary 7 degrees W. (*i. e.*, 173 degrees from the anti-meridian of Greenwich) will be numbered 54-173.

9. The local aeronautical unit sheets shall show, as far as the data is known, the following:

(a.) *Within the Limiting Meridians and Parallels.* Twenty-minute projection grid; roads divided into two classes according to their relative visibility from the air; railways of all kinds; cities and towns in outline and the plan of the principal public roads crossing them (villages similarly if practicable, otherwise their positions indicated); principal features of the surface water system; woodlands and other areas unsuitable for landing, aerodromes, hangars for airships, plants for balloon inflation, permanent landing places on ground and water, aeronautical ground marks; beacons and fixed navigational lights; marine light houses (height, range at sea level, color, and character of light); wireless stations, meterological stations, overhead electric power lines; remarkable objects; national frontiers; the frontier crossings for customs purposes prescribed by Annex H. Article 2; prohibited areas; principal air routes; names of important bodies of water; towns; and important villages; the topographical relief by shading and figures indicating heights, the most important of which to be surrounded by an oval ring.

(b.) *Outside the Limiting Meridians and Parallels.* A title, consisting of the name designating the locality and the index numbers of the sheet; a border scale graduated to minutes; the names of the neighboring sheets; latitude, South Polar distance, old and new notation of longitude (see paragraph 7); scale of kilometres; legend of symbols in English or French and in the language of the country publishing the map; magnetic variation diagram; key map showing abridged numbers of the sheet concerned and the eight surrounding sheets; frontiers and the names of the countries, parts of which are embraced by the key map; publisher's name and date of publication.

10. The forms of the general and local maps, titles, marginal notations, diagrams and legends, shall be as shown by the accompanying illustrations.

11. The general and local aeronautical maps and guide books of the areas traversed by the most important routes which may be established by international agreement shall be prepared first.

NOTE.—On account of the inadequacy of the usual methods of topographic mapping for making aeronautical maps, it is strongly recommended that steps be taken to survey from the air the areas along the most important international routes. Such surveys would would furnish indispensable information regarding the features necessary to be shown on the maps the aviator is to use.

II

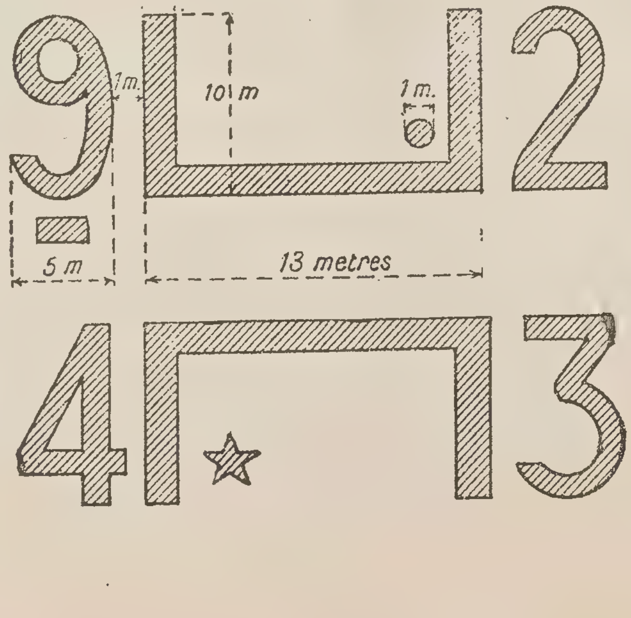
Universal System of Ground Marks

1. All ground marks shall conform with the scheme of numbering adopted for the unit sheets of the local international aeronautical maps.

For this purpose each mark shall show (see the diagrams):

(*a.*) The abridged number which designates the sheet within which it lies:

(*b.*) An open rectangle, whose short sides shall be oriented north-south; the frames shall be open toward the opposite half of the unit sheet;



(*c.*) A dot indicating the approximate position of the mark on the north or south half of the corresponding unit sheet.

The numbers shall be placed close to the frame at the top, bottom or sides, but not inside.

Where marks are placed so close to each other as to admit of possible confusion, the round dot may be replaced by a square, triangular or star-shaped dot.

It is recommended that the minimum dimensions of the marks be those indicated in the sketches.

2. Special attention shall be given to the distribution of marks along chosen international routes.

NOTE.—Steps to establish suitable marks for landing at night shall be eventually taken, in accordance with the decision of the International Commission for Air Navigation.

Annex G

COLLECTION AND DISSEMINATION OF METEOROLOGICAL INFORMATION

1. Nature and object of meteorological information to be furnished by Contracting States:—

A) " Statistical " is required for the purpose of indicating the degree of safety and convenience of different routes or aerodromes for different types of aircraft.

It consists of:—

a) Analysis and summaries of past meteorological records.

b) Summaries of current observations.

B) " Current " is required for the purpose of:—

a) Keeping a current record of the weather.

b) Making forecasts.

It consists of:—

1. The results of daily observations.

2. Lists of active stations at which these observations are taken.

C) " Forecasts " are for the purpose of telling all concerned when and where flying is possible and the best conditions for the same. They are statements of conditions anticipated:—

a) " Short period " during the next three or four hours.

b) " Normal " during the next 20 to 30 hours.

c) " Long period " during the next two or three days.

d) " Route " for particular region or route during the next six hours.

2. Methods and times of furnishing the different types of information:

A) " Statistical " is furnished by Central Meteorological Offices for general information.

a) Analysis and summaries of past records—by the publication of special handbooks giving averages, frequencies and extremes of the principal meteorological elements, together with charts and diagrams; prominence to be given to meteorological conditions of areas known to have special meteorological peculiarities.

b) Summaries of current observations—by the monthly publication of the information obtained each month.

B) " Current " is furnished by meteorological offices to meteorological offices.

a) Results of daily observations—telegraphically by:—

1. Regular reports at fixed hours (see Appendix I) and

2. By special reports at intermediate times when requested (see Appendix II).

b) Lists of stations whenever necessary, to keep other countries informed where observations are being taken, giving also local and topographical details affecting weather conditions at each station.

c) " Forecasts " are furnished by Meteorological Offices for general information by publication in the public Press, telegraphically to other countries if required, or any other, the best means to bring them to the notice of those requiring them (see Appendix III).

Appendix I

REGULAR REPORTS

These are of two kinds:—

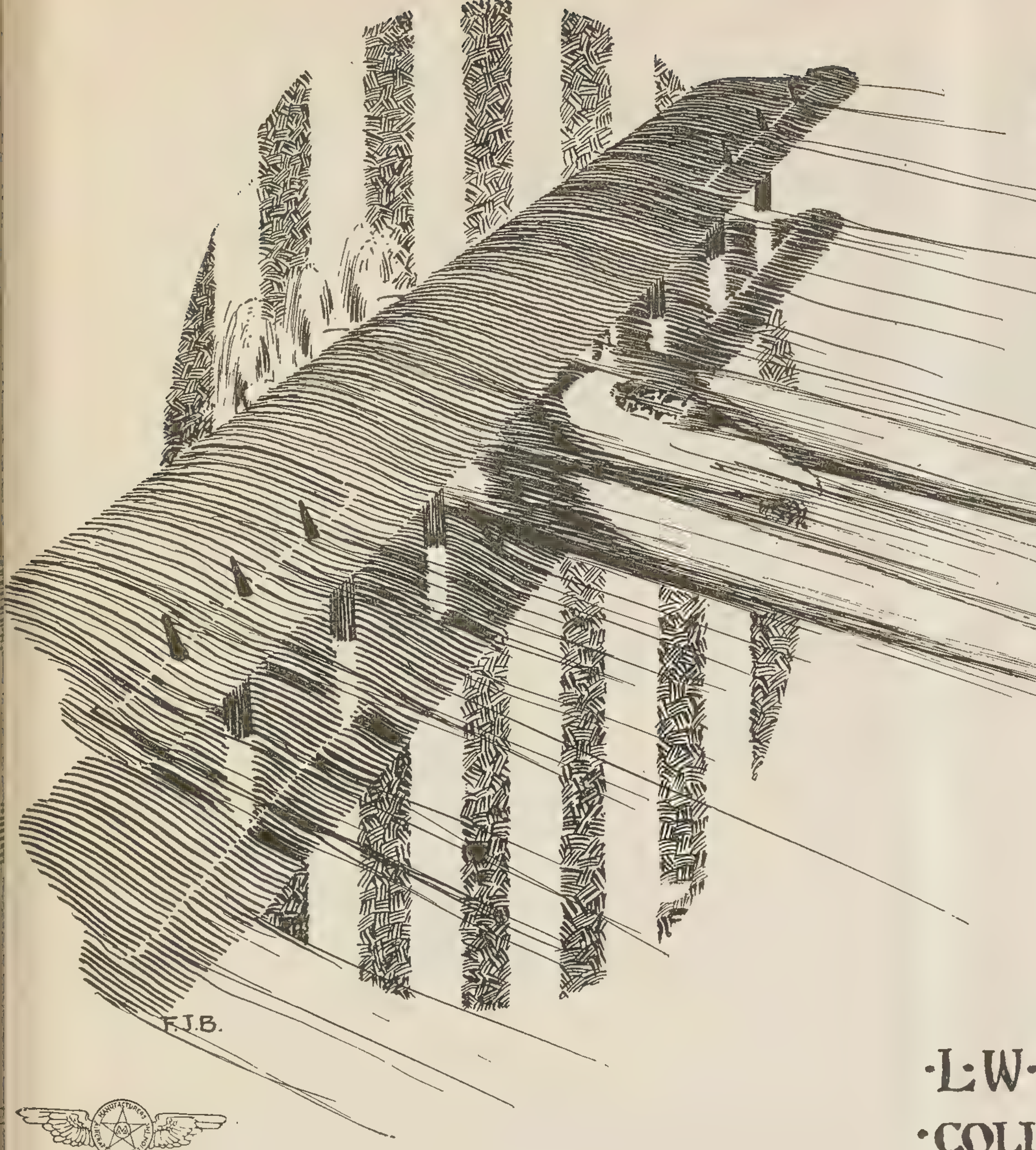
1. Individual station reports.

2. Collective station reports.

1. Individual station reports are the results of observations of individual stations, taken at 0100, 0700, 1300, and (1800 or) 1900 G.M.T. The reports are made as soon as the observation has been taken and are rendered to a central collecting station or office; where reports for only two of these hours are possible or sufficient, the hours should be separated by an interval of twelve hours. (It is recommended that the standard hours be changed to 0300, 0900, 1500 and 2100 G.M.T. by international agreement.)

Reports will give information on the following, whenever possible:—

(*Continued on page* 16)



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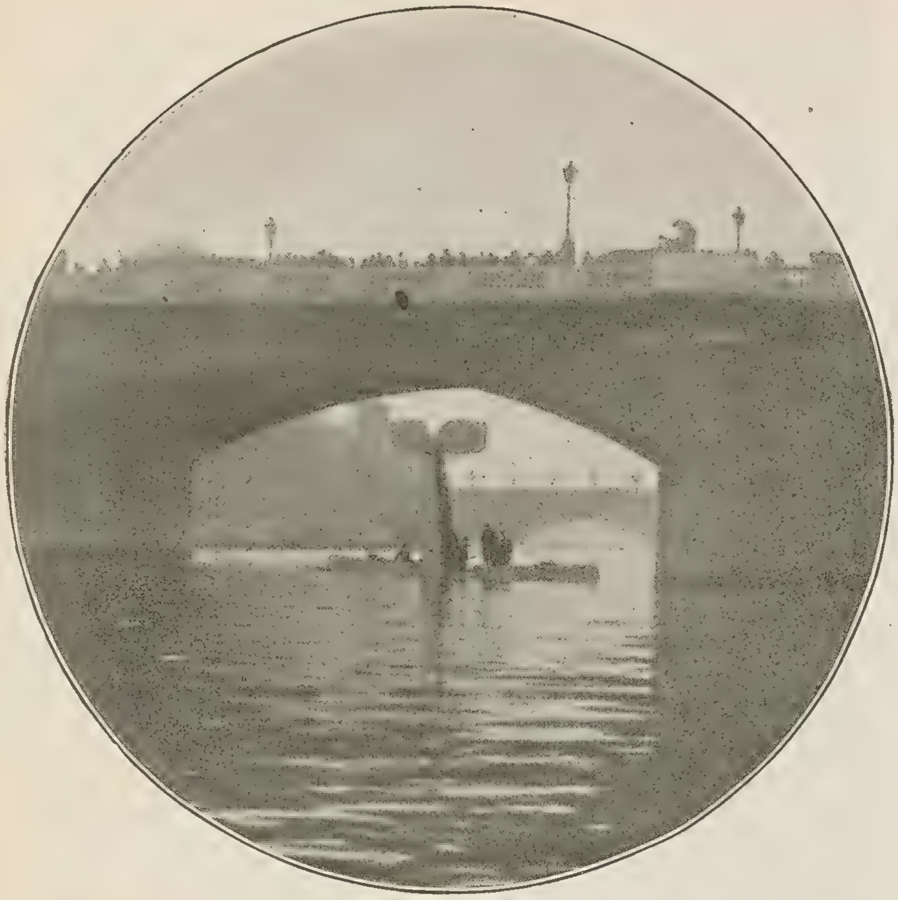

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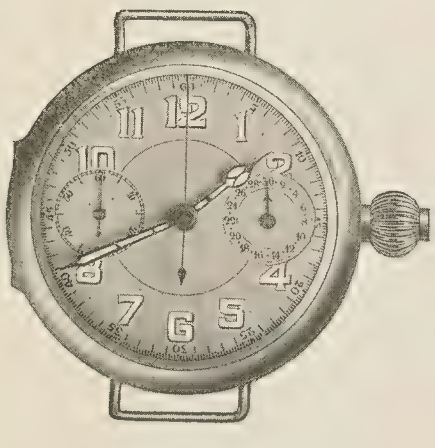

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The only practical "Aviators" split wrist chronograph. 18 jewels. Sterling silver case. Hands and figures treated with a special two year guaranteed radium material passed by U. S. Gov. Furnished with special "Aviators" wrist strap. Suitable for wearing outside of coat sleeve. Price, Net, $60.00

While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

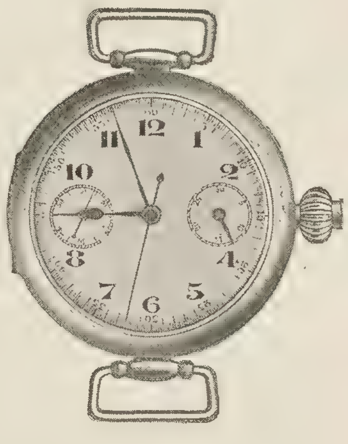
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS



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Peace Treaty Rules Relating to Aeronautics

(*Continued from page* 12)

1. Wind.
2. Pressure.
3. Temperature and humidity.
4. Fog and visibility.
5. Clouds.
6. Precipitation.
7. Thunderstorms, hurricanes, tornadoes, duststorms.
8. Other weather phenomena.
9. State of sea,

And also on upper air currents and upper air temperature and humidity, from stations where facilities are available for observation.

Reports will be made in the general form and in the codes given in Appendix IV.

2. Collective reports are a collection of the individual reports received by a central station or office and transmitted to other central offices. They are of three classes:—

Class 1. The central office in this case is usually the main office of a country; it transmits its reports, within 1½ hours of the time the observations are taken at the individual stations, to all main offices of other countries within a radius of 1,500 kilometres.

Class 2. These are reports made for the purpose of giving countries over 1,500 kilometres distant information essential to making their own forecasts. The central office is that of a selected State which possesses a high-power wireless station capable of world-wide ranges (minimum range 3,000 kilometres). The report is made within three hours of the observations, and is a collection of reports selected from the Class 1 reports and abridged (see Appendix IV). It should include a forecast of conditions in the country of origin.

Class 3. These are local reports made by local centres to other local centres (any within 500 kilometres). The report is a collection of reports, selected from the Class 1 reports from stations in the vicinity and abridged (see Appendix IV). It is made within 30 minutes of the time of observation.

Appendix II

SPECIAL REPORTS

Special reports give the results of continuous observations at aerodromes having meteorological stations on recognized air routes. They are to be rendered within thirty minutes of a request from a central office on a specified aerodrome on the route. The maximum distance from which these reports will be required is 500 kilometres. The requests may take the form of a demand for hourly reports.

The reports are rendered by telephone or wireless, and may be from one country to another in the case of an international air route. The reports when made by telegram will be in the form and code given in Appendix IV.

Appendix III

FORECASTS

Short-period forecasts covering three to four hours will give a statement of the anticipated conditions of cloud, weather, surface wind and visibility, together with direction and speed of wind at heights of 1,000 and 2,000 metres, and an estimate of meteorological fitness for different types of aircraft.

Normal forecasts for twenty to thirty hours will give similar information, but in more general terms.

Long-period forecasts give a general statement of the prospects for the next two or three days.

Route forecasts are made twice daily by central offices from information received from individual stations and will give a statement of conditions anticipated in the different regions or routes of the country for about six hours ahead.

Appendix IV

GENERAL FORM IN WHICH REPORTS ARE TO BE RENDERED AND CODES FOR THEIR TRANSMISSION

Individual stations will be allotted station call signs, *i.e.*, an index group of letters or figures which will be used in all reports to indicate the station, and will also serve as the wireless call sign. These should be internationally distinct.

The general form is given in meteorological symbols or letters. For purposes of transmission an appropriate figure value is given to each symbol or letter in accordance with codes made public in this appendix.

(*To be concluded in an Early Issue*)

Hope Eden Goes by Plane

An actress has used the airplane as a means of transportation. Hope Eden began her tour on the Keith circuit by flying on August 31 from Buffalo to Syracuse in a Curtiss JN-4D airplane piloted by J. D. Hill, of the sales department of the Curtiss Aeroplane and Motor Corps.

Miss Eden Alighting at Syracuse

Miss Eden's first flight will soon be followed by others. From Syracuse her itinerary calls her to Albany, and this trip, as well as later ones from city to city, taking her through Schenectady, Troy, Worcester, Mass.; Springfield, Mass.; Hartford, Conn.; New Haven, Conn.; Bridgeport, Conn.; Philadelphia, Baltimore, and the cities of the South, is to be made by air.

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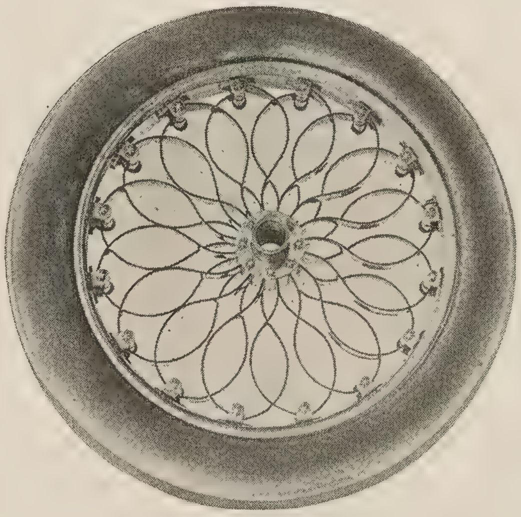

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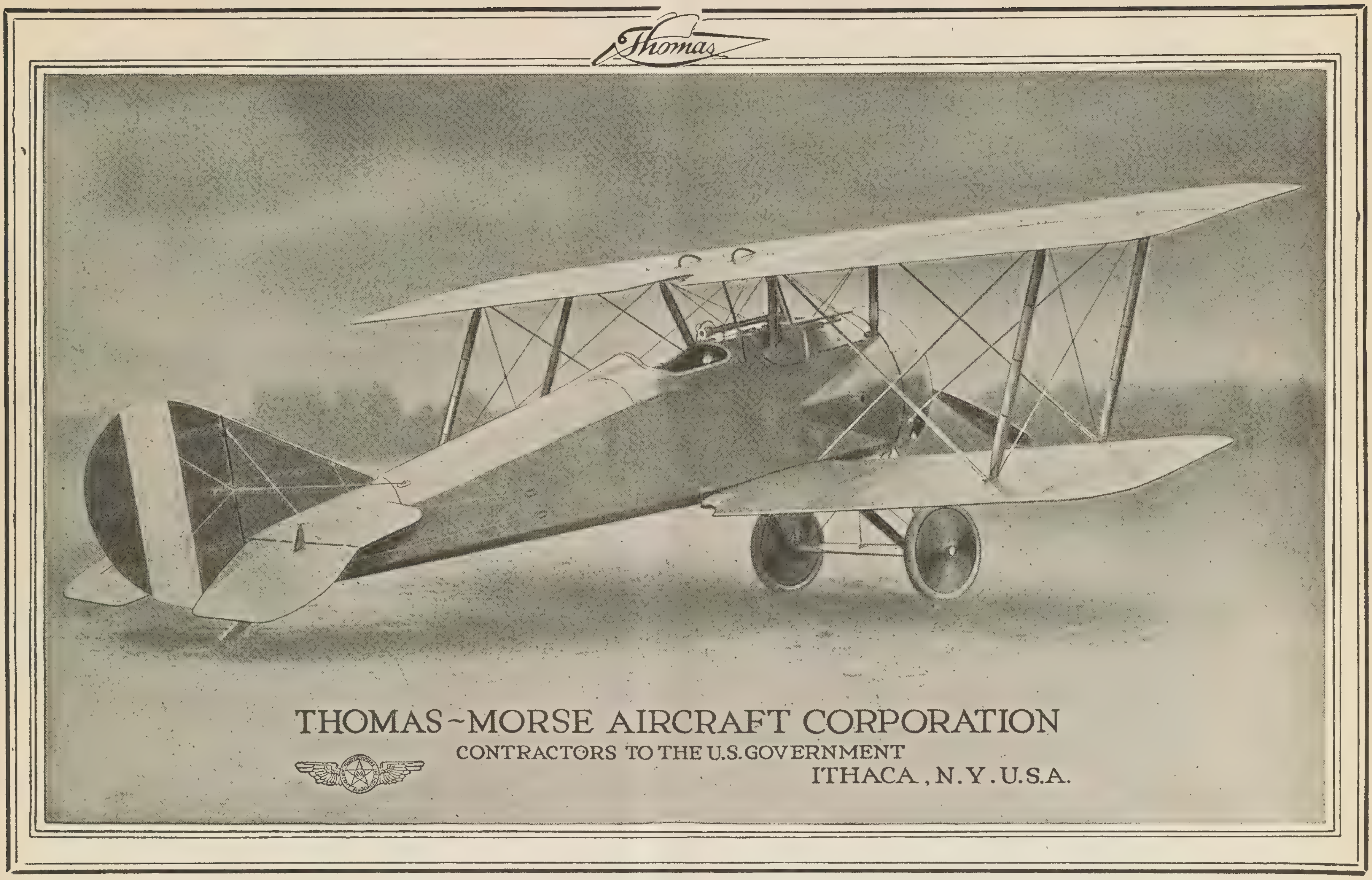

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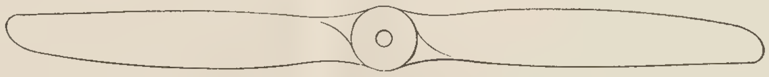

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Inquiries on aeronautical or allied subjects will gladly be answered by the editors of AIRCRAFT JOURNAL by letter to the inquirer and included in these columns. Questions to be answered by mail should be accomplished by stamped addressed envelopes.

Inquiry—I would like advice with regard to a school giving courses in aeronautical engineering.

W. T.—The Brooklyn Polytechnic Institute will give an evening course in aeronautical engineering. If you will write to Prof. E. F. Church at the Institute he will give you full particulars.

Inquiry—What is the nearest first-class institution that gives the degree of aeronautical engineer?

M. A. P.—The Massachusetts Institute of Technology has a course in Aeronautical Engineering leading to the Master's degree. It is possible that by this time there is an undergraduate course likewise.

Inquiry—Will Lieutenant-Colonel Hartz in his flight around the country stop at all cities that have recruiting stations?

G. J. F.—In his flight around the country, Colonel Hartz expects to touch the following points:

Washington to Augusta, Me.
Augusta to Duluth.
Duluth to Seattle.
Seattle to San Diego.
San Diego to San Antonio.
San Antonio to Miami, Fla.
Miami to Washington.

The flight will include thirty-one states; ninety-five cities will be touched or grazed, and the lakes and waterways to be flown over will total forty-eight.

Inquiry.—Where can I obtain a book giving full particulars of assembling a JN-4?

Answer.—Write to the Curtiss Aeroplane and Motor Corp., Buffalo, N. Y., for JN-4 manual, but Colvin's "Aircraft Mechanics' Handbook" and Rathbun's "Aeroplane Construction and Operation" will give you a fair amount of information.

Inquiry.—Has the Government for sale anywhere a Curtiss JN-4D or H, T-M S-4C or Vought VE-7 plane for passenger carrying and exhibition work. What department should be addressed for further information?

Can data on upkeep of planes in mail service be secured?

Also please state procedure for RMA to get a civilian flying license.

H. R. C.—More information about this can be obtained by writing to District Bureau of Aircraft Production, Washington, D. C., attention Materials Disposal Division. You might also write to the Curtiss Aeroplane and Motor Corp. at 52 Vanderbilt Avenue, New York; the Thomas-Morse Aircraft Co., Ithaca, N. Y., and Lewis & Vought, Webster and Sixth Avenue, Long Island City, L. I.

With regard to data on upkeep of planes in the Mail Service, you will find the Post Office reports on this are printed regularly in *Aviation,* the last one appearing in the July 1 issue.

The President has rescinded the proclamation requiring a license from the Army and Navy Board of Aeronautical Cognizance, so that there is now no necessity of obtaining a license for civilian flying.

Inquiry.—I am desirous of learning the mechanism of airplanes. Can you kindly recommend me to some reliable school where this is taught?

I. K.—If you will write to Prof. E. F. Church, Polytechnic Institute, Brooklyn, N. Y., he will give you particulars of an airplane course they are giving. There is also a course at the College of the City of New York.

An Oriole to Oil Lands

R. W. Hubbard, vice-president and general manager of the Inland Refining Co., Tulsa, Oklahoma, has purchased a Curtiss Oriole in order that he might save time in visiting his various interests in the oil fields. Mr. Hubbard's Oriole was delivered on August 24. On August 25 Mr. Hubbard left Tulsa, Oklahoma, for Jackson, Tenn. He left Tulsa at 11 in the morning, and arrived at Jackson, Tenn., at 6 in the evening. The total distance covered was 500 miles, and the total flying time was 4 hours and 55 minutes.

CLASSIFIED ADVERTISEMENTS

Rates, 25 cents per agate line per insertion. Black face type, 50 cents per agate line. Forms close Saturday preceding date of publication.

PHOTOGRAPHIC HISTORY OF AVIATION SINCE 1907 TO PRESENT DAY; THIRTY DIFFERENT TYPES AEROPLANES, THREE DOLLARS INCLUDING FOREIGN AND LATEST TYPES. H. M. BENNER, LOCK BOX 275, HAMMONDSPORT, N. Y.

Jean Servantie, formerly French Sergeant-Aviator in Tours, Cazaux, la Perthes, Escadrille BR 128, now in America for commercial aviation, would enjoy news from his American flying friends. 146 West 36th Street, New York City.

FOR SALE—Three JN's, Canadian, perfect condition, one Curtiss F boat. Lawrence Sperry Aircraft Co., Farmingdale, L. I. Telephone Farmingdale 133.

FOR SALE—Two passenger biplane, 36 ft. wings; 7-cylinder Gnome motor. All surfaces newly covered. Guaranteed in best flying condition. Price $1500. C. H. Rutherford, First and C Streets, San Diego, Cal.

Proposals for Airplane Design and Construction.—Office of Contracting Officer, Eng. Div., A. S., McCook Field, Dayton, O.—Sealed proposals will be received here until 10 A.M., Oct. 15, 1919, and then opened, for furnishing certain types of experimental airplanes, designed and constructed by successful bidders. Further information on application.

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(5) The only machine to fly over London with 40 passengers. Handley-Page with **ROLLS-ROYCE Engines**

(6) In practically every successful long-distance bombing raid into Germany carried out by the **BRITISH ROYAL AIR FORCE,** planes were used, fitted with **ROLLS-ROYCE Engines**

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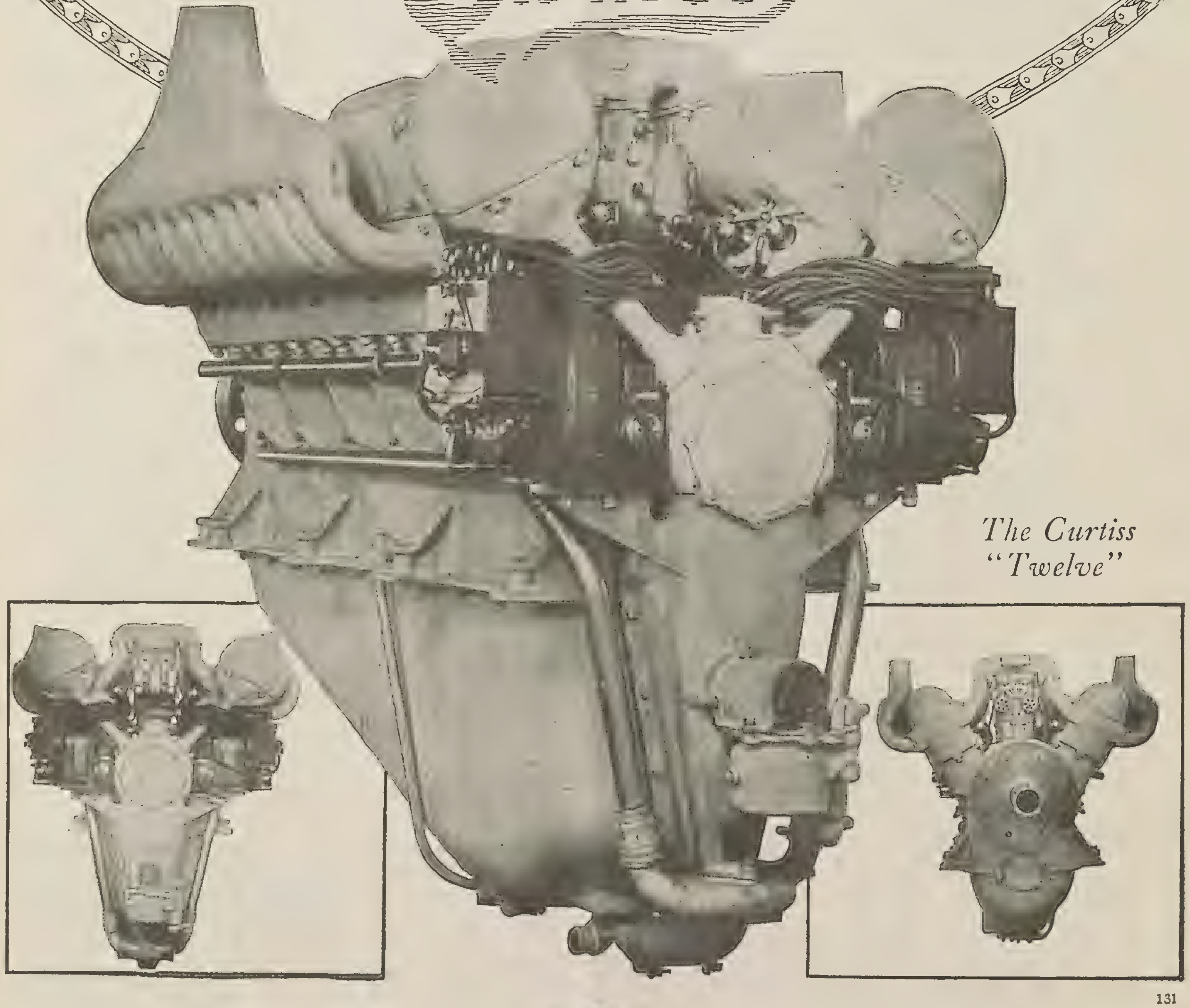

The Curtiss "Twelve"

131

Member Manufacturers' Aircraft Association

V #14

AIRCRAFT JOURNAL

October 4, 1919 Every Saturday Price Ten Cents

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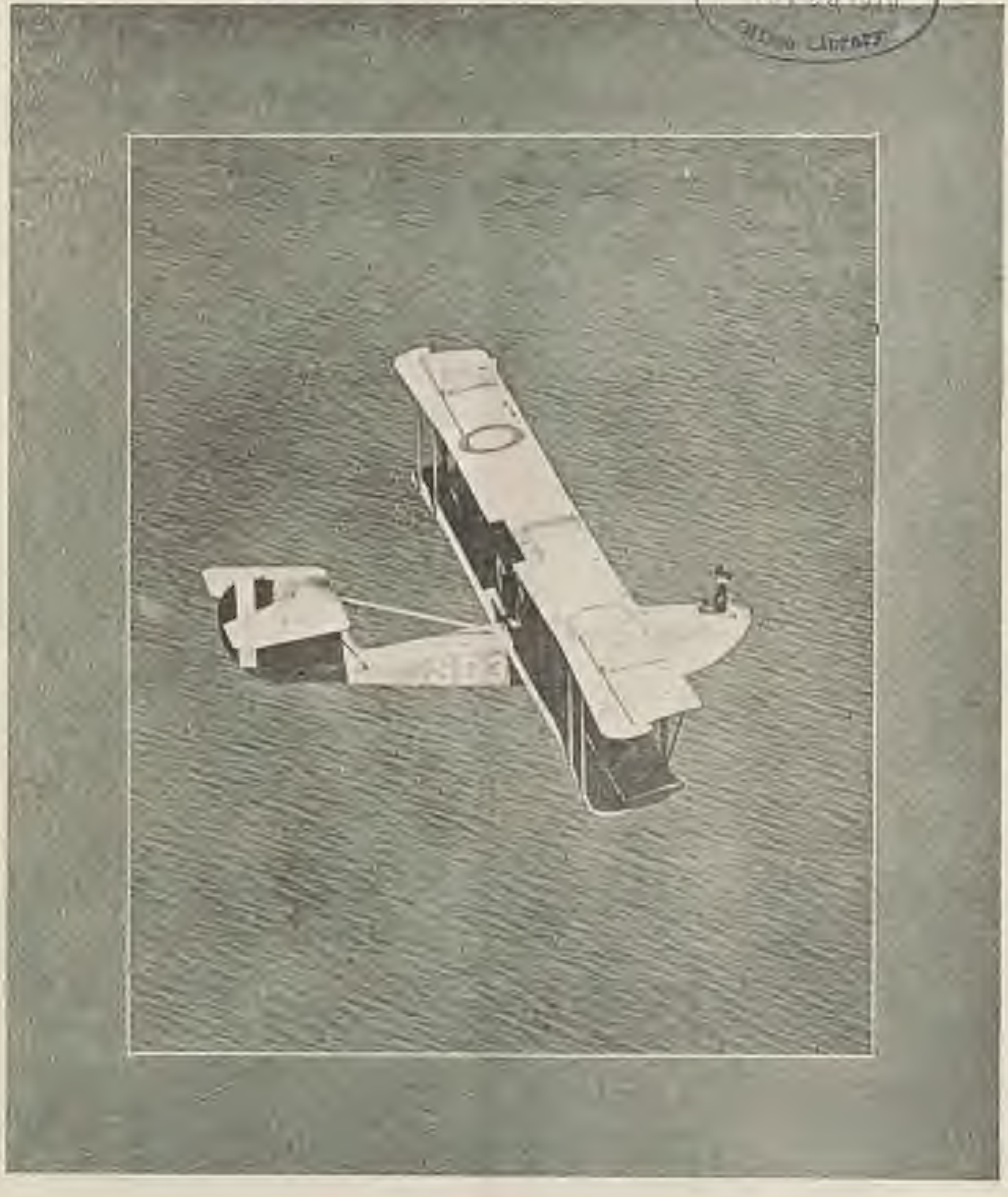

Photo by U. S. Naval Air Service; from Ledger Photo Service.

Seaplanes Make Record Flight

One of the Seaplanes Which Made the Six Hundred Mile Flight Between San Francisco and San Diego, Cal., Recently. The Trip Was Completed in Seven Hours' Actual Flying Time. These Planes Made a Record for Their Class. A Moving Picture Machine Is Shown in the Cockpit

Owing to the General Strike of the New York Printers, This Issue Was Printed in a Rural Newspaper Office.

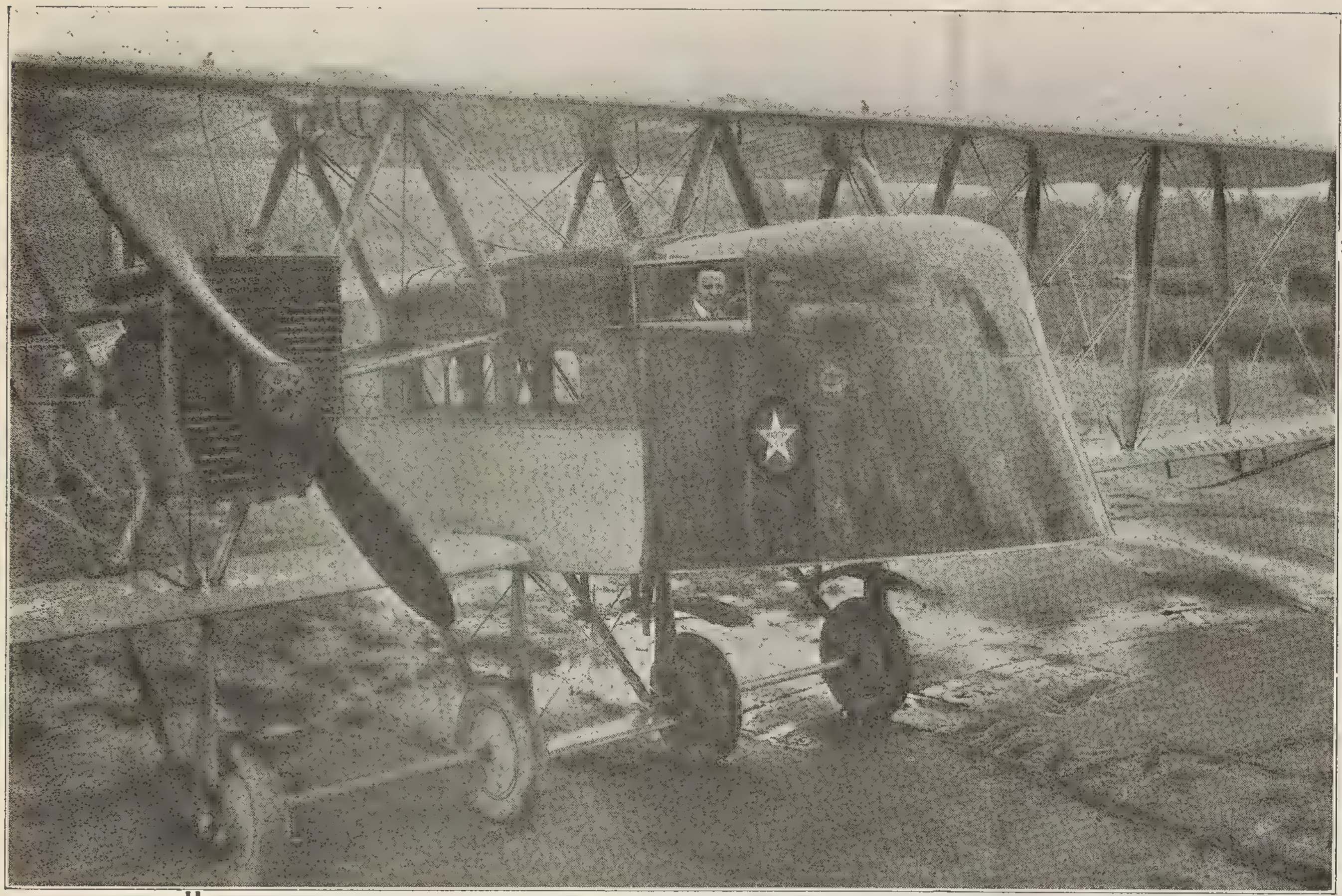

Photo (c) Underwood & Underwood

The U. S. Martin Army Passenger Transport Plane

First in War

Commercial Aviation

Has These Essential Requirements

1. Safety and Dependability.
2. Comfort and Capacity.
3. Speed and Endurance.

These attributes are built into every Martin airplane.

The Martin 12 Passenger Airplane

Will dominate the commercial field just as the MARTIN BOMBER has demonstrated its military supremacy.

THE GLENN L. MARTIN COMPANY
CLEVELAND

Contractors to the United States Government

MARTIN U.S.A.

First in Peace

Great Transcontinental Air Race

One Hundred Machines, Fifty Each Way, To Start Across the Continent on Oct. 8

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The greatest endurance tests ever attempted by military airplanes are to begin Oct. 8, when transcontinental flights will be started simultaneously at Hazelhurst Field, Mineola, L. I., and at San Francisco under the direction of the Aircraft Division of the army. An order from Major Gen. Charles T. Menoher, commanding the Air Service, has been issued, authorizing preparations for the tests.

In his message, General Menoher prescribed the rules to govern the contest. The impression among officers at the Mineola Field was that prizes or awards would be given to the winners of the events, but there was nothing in the order to guarantee this.

All army fliers with planes having speed of not less than 100 miles an hour will be permitted to participate. This will apply to all fliers in the Eastern, Central and Western Army Departments.

Airplanes to Be Numbered

The airplanes starting from Mineola are to be numbered 1 to 50. Those starting at San Francisco will be numbered 50 to 100. To avoid accidents, night flying will be prohibited. The numerals are to be painted on each side of the fuselage, and upon the under side of one of the wings.

Compulsory stops of not less than thirty minutes nor more than forty-eight hours must be made en route in either direction at control stations in Binghamton, Rochester and Buffalo, N. Y.; Cleveland and Bryan, Ohio; Chicago and Rock Island, Ill.; Des Moines, Iowa; Omaha and North Platte, Neb.; Sidney, Cheyenne, Olcott, Wolcott and Green River, Wyo.; Salt Lake City, Utah; Salduro, Battle Mountain and Reno, Nevada, and Sacramento and San Francisco, Cal.

The flight will be a one way and not a round trip contest.

Three different classes of honors will be competed for. They are:

Shortest time across the continent.

Fastest actual flying time as calculated between controls.

Fastest flying time based on the handicap to be given each class of machine.

Should the aviators be forced to land for any reason outside of the specified controls the time they remain on the ground will be counted in their flying time.

Excitement Among Fliers

Commanding officers along the line of flight have been instructed that arrangements for feeding the men must be made locally with the Red Cross or other similar agencies at government expense.

The telegram from General Menoher giving details about the contest, about which there have been rumors for several days, created great excitement among the fliers at Hazelhurst, Roosevelt and Mitchel fields. Already a large number of the aviators here, including many who took part in the recent New York-Toronto International Derby, have indicated their intention of taking part in the cross-country air race.

Owing to the limitation of the race to machines capable of a speed of 100 miles an hour or more, the only types expected to enter are De Haviland-4's, De Haviland-9a's, Le Pere fighters, and S. E.-5a's.

The machines flying from East to West will have the advantage of flying with the daylight. This advantage is counterbalanced, however, by a strong trade wind blowing steadily over the Sierra Nevadas in a west to east direction. The airplanes flying from San Francisco to Mineola will find this wind of great advantage, because it will be on the tails of their machines, and in all probability will add another forty miles an hour to their speed. Only army machines and army pilots will be entered in the race.

Aeronautic Engineering

The bill (S.2733) to provide for the training of officers of the Army in aeronautic engineering, and the issue of equipment and materials therefor was considered as in Committee of the Whole.

The bill had been reported from the Committee on Military Affairs with an amendment, on page 2, line 1, after the word "appropriated," to strike out "and he is authorized to furnish to institutions to which officers are so detailed such equipment and material belonging to the War Department for use in connection with courses in aeronautic engineering as he may deem advisable, subject to such rules for use, compensation for use, accounting, report, and return as he may prescribe," so as to make the bill read:

"Be it enacted, etc., that the Secretary of War be, and he hereby is, authorized to detail such officers of the Army as he may select, not exceeding 25 at any one time, to attend and pursue courses of aeronautic engineering or associate study at such schools, colleges, and universities as he may select.

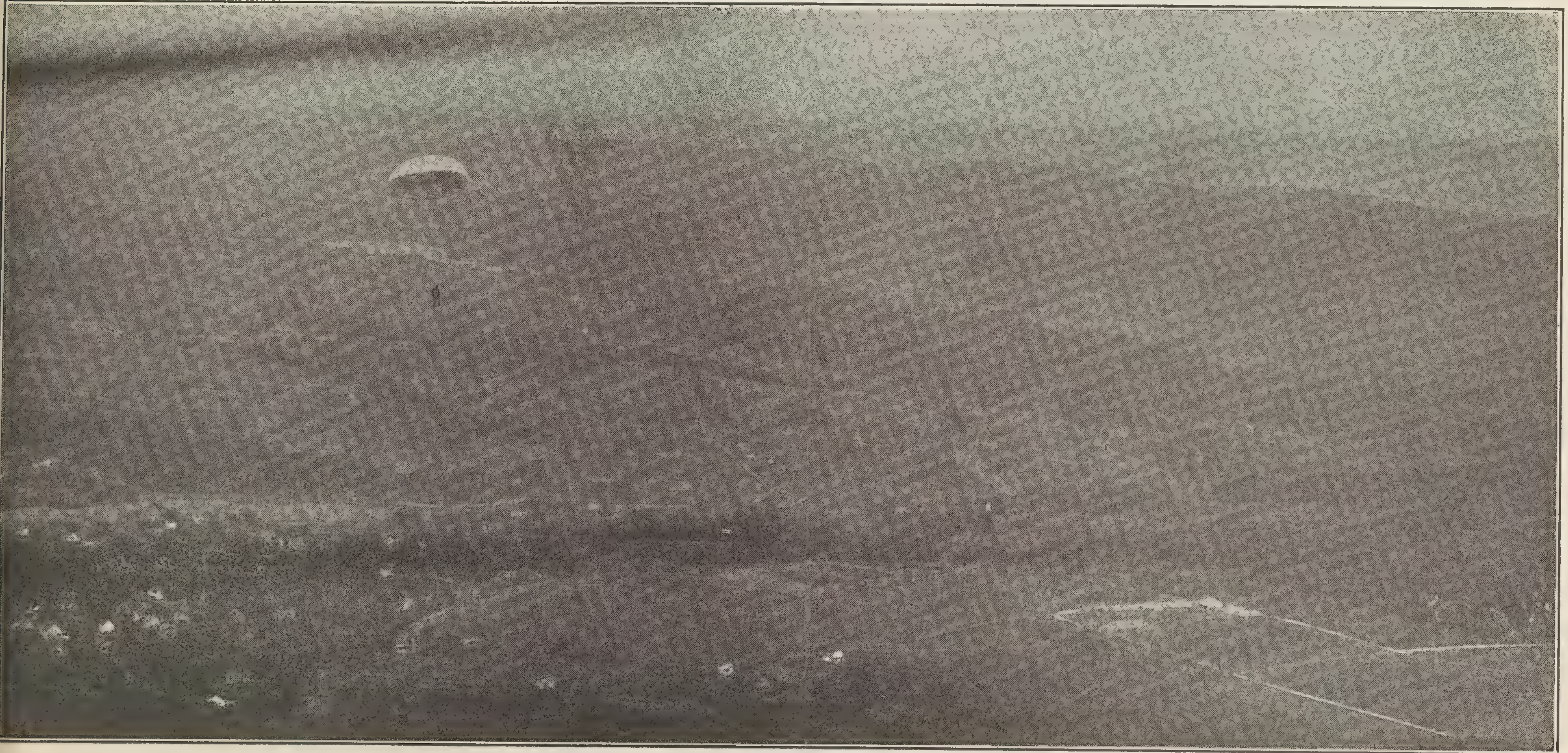
"Sec. 2. The Secretary of War is authorized to pay tuition for the officers so detailed and to provide them with necessary textbooks and technical supplies from any moneys available for the Air Service of the Army not otherwise specifically appropriated."

The amendment was agreed to.

The bill was reported to the Senate as amended, and the amendment was concurred in.

The bill was ordered to be engrossed for a third reading, read the third time, and passed.

The title was amended so as to read: "A bill to provide for the training of officers of the Army in aeronautic engineering."



Lieut. W. H. Sheridan Dropping from an Airplane at Scranton, Pa., Municipal Landing Field, Shown at the Right

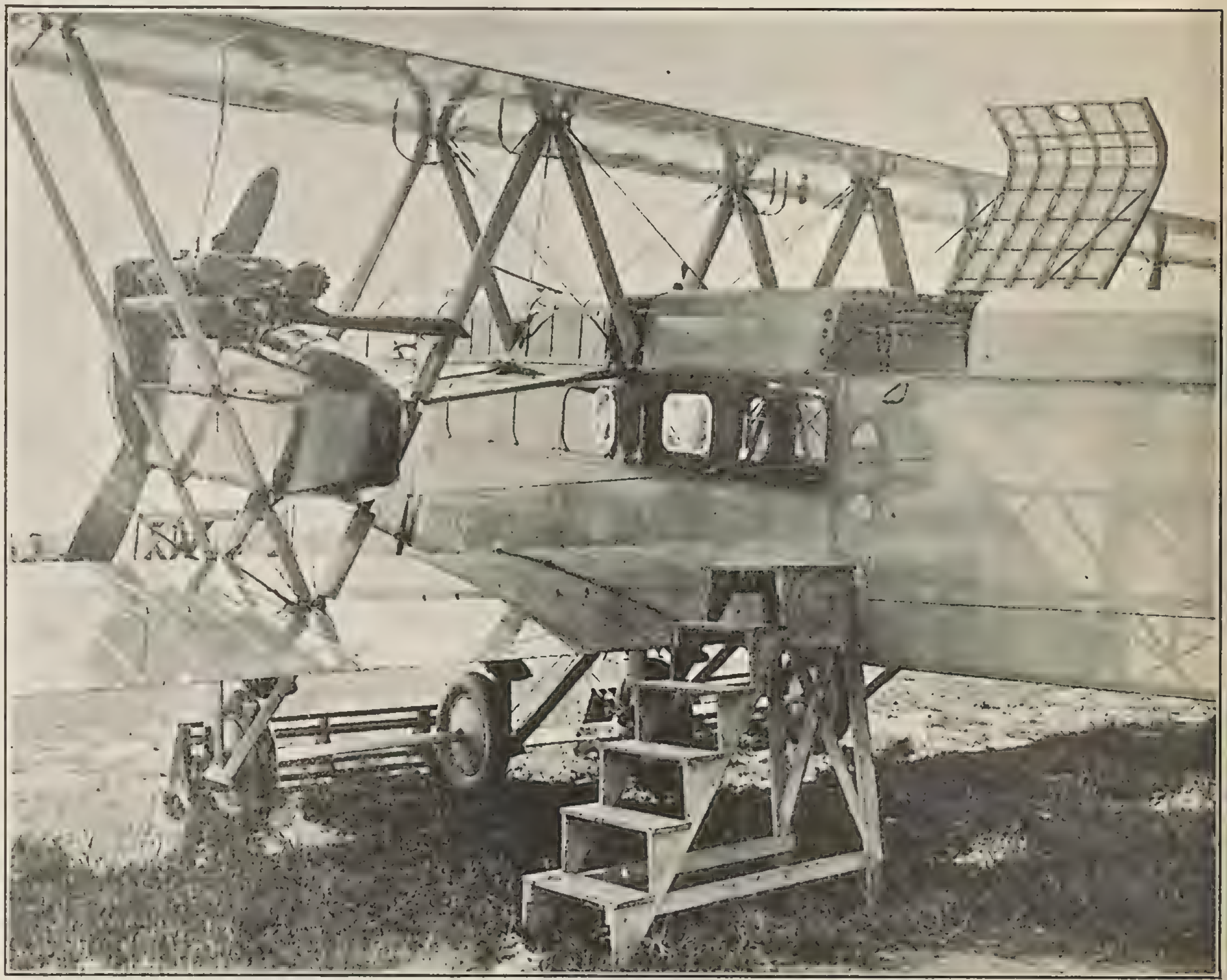
Speedy Flight of the Martin Army Transport Plane

From Cleveland to Dayton, Ohio, at an Average of 117.2 Miles an Hour on Sept. 17

The largest and fastest military transport in the world came into the possession of the U. S. Air Service on Sept. 17 when Eric Springer flew the U. S. Martin Army Transport plane from Glenn Martin Field, Cleveland, to McCook Field at Dayton. With Springer, Tom Carroll and W. M. Henry of the Martin Co., and W. H. Crutchfield, government representative on board, the plane travelled the 215 miles in 110 minutes, an average of 117.2 miles an hour. More than half of the trip was made at an altitude of 9000 feet because of heavy clouds, and a side wind interfered somewhat with Springer's attempt at flying the ship by compass. He held to the course, however, and made a perfect landing at Dayton despite the fact that he had never before flown a plane in which he was completely enclosed.

The Martin transport plane is the well known Martin bomber slightly changed to carry passengers instead of machine guns and bombs. The main difference is in the fuselage which is completely enclosed. The nose, which is covered with Pyralin, a celluloid composition, reinforced by aluminum strips, accommodates four persons, two passengers in the extreme nose, and two members of the crew seated at dual controls just forward of the wings. Entrance to the forward passenger compartment is made through a trapdoor in the floor which is ingeniously operated by means of a lever in the floor of the pilot's compartment.

The fuselage contains eight leather seats, four on each side with an aisle between. Good sized windows of triplex, non-splintering glass give a fine view. Entrance to these seats and to the pilot's compartment is by means of a trap door in the top of the fuselage, about half way back. Footholes in the side of the fuselage close automatically and the crew and passengers climb up the side and down a ladder, walking forward in the fuselage to their seats.



CENTER PORTION OF THE MARTIN TRANSPORT AIRPLANE

LEFT TO RIGHT—W. H. CRUTCHFIELD, U. S. GOVERNMENT REPRESENTATIVE; W. M. HENRY AND TOM CARROLL OF THE GLENN L. MARTIN CO.; ERIC SPRINGER, PILOT

Passengers in Ordinary Clothes

All four who rode on the initial trip were dressed in their ordinary street clothes entirely without the goggles, helmets and leather coats that seem to be necessary in open planes. Messrs. Crutchfield and Henry, who rode inside the fuselage, wrote letters, kept a log of the trip, read newspapers and magazines and got up and walked around, inside of the plane without seriously disturbing the balance of the ship.

The streamlining of the army transport is splendid and, coupled with its light weight, adds considerably to the speed of the ship. The trip with four passengers and 200 pounds of ballast was made at a rate of 117 miles an hour with a

(*Continued on page* 6)

AIRCRAFT JOURNAL

Member Audit Bureau of Circulations

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Necessity of a System of Landing Fields

A. H. Flint Points Out the Object Lessons Learned from the Toronto-New York Airplane Race

The necessity of a system of landing fields at intervals of from twenty-five to fifty miles was demonstrated by the New York-Toronto airplane race of Aug. 25 to 30, in the opinion of A. H. Flint, president of the Manufacturers' Aircraft Association and general manager of the L-W-F Engineering Corporation. Speaking for the Aircraft Association he was quoted in a New York newspaper as follows:

"The Manufacturers' Aircraft Association finds three great object lessons in this contest. The first is the necessity for the establishment, with proper Federal supervision, of national and international air routes and a system of adequate landing fields; second, the development of an operations service capable of handling the aerial traffic which is expected to appear within the next few years; third, construction and development. We may with confidence predict that the New York-Toronto route is destined to become one of North America's great highways of commerce. This would be true if for no other reason than that trade inevitably follows a trail which has been safely opened by pioneers.

"In response to inquiries from various points along the New York-Toronto route, we recommend the immediate expansion of major landing fields at New York City, Albany, Utica, Syracuse or Rochester, Buffalo and Toronto. The only accident which marred the recent race occurred at Albany, where the field was found to be inadequate, poorly placed and in no condition to handle even occasional machines. The route between New York and Toronto is something over 500 miles in length. We recommend the establishment of three or four cardinal landing fields over such a route.

"In between, at distances from twenty-five to fifty miles apart, there should be emergency landing fields so that aviators who, for engine trouble or any other reason, are compelled to come down may make a safe landing. Had such emergency landing field existed during the recent race, it is safe to say that a much larger percentage of the contestants would have completed the trip.

"We urge the establishment of an emergency landing field near West Point, forty miles up the Hudson; another at Poughkeepsie, twenty-five miles on; forty miles further at Catskill. Fifteen miles beyond Albany there should be an emergency field at Schenectady; fifty miles farther at Herkimer, fifteen miles on at Utica; another fifty-mile stage would bring the flyer to Syracuse; another thirty miles to Auburn, fifty miles farther lies Rochester, thirty miles Batavia, and another thirty-five miles Buffalo. From Buffalo it is sixty miles to Hamilton, Ontario, and again another sixty miles to the final terminate, Toronto.

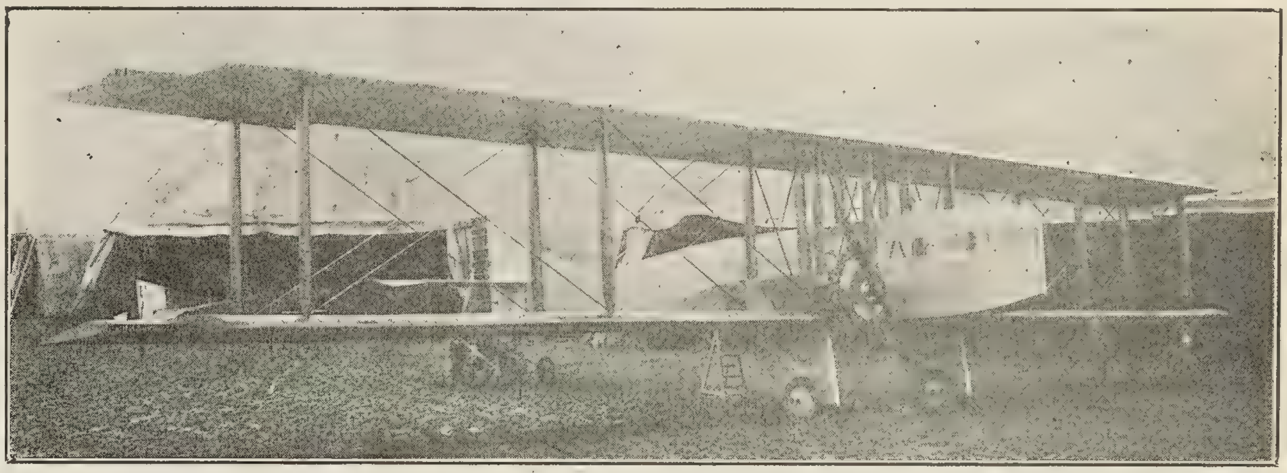
"If Chambers of Commerce in the localities named will take steps to provide emergency facilities, we may safely predict that the air highway between Toronto and New York will be greatly patronized during the coming year.

"Aside from the fact that the aviation industry is being 'hard put' to survive the reconstruction period and take its legitimate place among similar industries of the world, it is also a fact that the present is a very critical time in all matters aeronautical in the United States. This is due to the fact that such progress as we have made in the establishment of landing fields and the mapping out of routes has been with purely national purposes in view.

"Now comes the International Aerial Convention as adopted in connection with the Peace Conference in Paris. The convention, which is shortly to come before the United States Senate for discussion and probable ratification, will, if adopted, form the basis for aerial legislation in this country. It lays down very wisely the principle of Federal control, but at the same time it proposes landing fields, flying rules and signals of operation and control which are radically different from those thus far developed in this country. Therefore if Chambers of Commerce in their effort to help aviation will keep in close touch with Federal authorities, it will mean that much wasted effort and possible duplication will be avoided.

"Radio advance, to my mind, indicates that the time is not far distant when flying routes will literally be block signalled by the radio telegraph or the radio telephone. Radio stations will be established, not only at the major control points, but at the emergency flying fields. Each station will send out its particular call, so that an aviator, as he comes into range, will know exactly where he is. When he comes to his destination it will be much more simple than at present to be guided quickly and safely to the proper landing field. The radio also will make it possible to despatch airplanes for freight, passenger or postal uses regularly and, we hope, on schedule, much as trains are now despatched from the great passenger terminals.

"Speaking from an engineering standpoint, the New York-Toronto race demonstrated what manufacturers have frequently claimed to be the case, namely, that the airplane as such, because of its inherent strength, is probably the safest vehicle in existence. Most of our difficulties at present come either from means of propulsion or from embarrassment in landing fields."



FARMAN PASSENGER BUS—TWO 250-HP. SALMSON ENGINES—SOON TO BE SEEN IN AMERICA

Vincent now Colonel

J. G. Vincent, vice-president of engineering of Packard Motor Car Company and co-designer of the Liberty aircraft engine, has been commissioned by the President a colonel in the Officers' Reserve Corps of the United States Army. The appointment is to the aviation section of the Signal Corps and specifies a flying status.

Taking service with the Army in 1917, Mr. Vincent was given the temporary commission of major; later he was promoted to lieutenant-colonel for his signal services. When the armistice was signed, several of the regular Army officers expressed the hope that he would accept a commission in the reserve corps, with the probable rank of major, which at that time was the highest which the general staff could recommend. A recent enabling act by Congress permitted his being commissioned a colonel.

"I am glad to accept this commission because I believe the officers' reserve corps offers the best opportunity that peace-time affords the citizen for service to his country," said Colonel Vincent. "It is an effective means of lining up for the government, in times of peace, the men who, by special training or talent, should be immediately available to the government in time of war.

"Obviously, a complete organization for war is impossible, and perhaps undesirable. But our experience of the last few years must have taught us the value of a nucleus capable of rapid expansion in both numbers and abilities. The officers' reserve corps joins with the regular establishment, and such other means as the national and state governments can provide to make this nucleus more comprehensive."

Colonel Vincent counts himself particularly fortunate in having in the Packard's new aviation field, soon to be formally dedicated, excellent facilities for maintaining and enlarging his experience as practical pilot and aeronautical engineer. He is employing these facilities, and devoting a great deal of his time, to experimental aircraft engineering development in the government's interest.

Rolls-Royce in America

Claude Johnson, managing director of the Rolls-Royce Co. of Derby, England, announces that plans are being made for the establishment of a branch factory to manufacture Rolls-Royce products in America. The undertaking is to be financed through Aldred & Co., New York bankers, who will provide the capital, probably $7,000,000. A factory is to be erected here, but under the present British war act it is not permissible to transfer British capital to this country for such industrial purposes. It was necessary, therefore, to obtain funds in this country before the project could be worked out.

The new venture, it is explained, is the result of a growing demand in America for Rolls-Royce products. Orders now on hand in the British plant will absorb all of the British output for a year and a half, it was said. In 1918 many factories at the request of the British Government made units of the Rolls-Royce aero engine and that experience is said to have satisfied the company that with proper supervision the Rolls-Royce products can be made here as excellently as they are made in England.

While the site of the new factory has not been decided upon, it is known that operations will be directed by experts from England. The chassis to be made in the American and British plants will be identical in every respect.

The company has branch houses in New York, London, Madrid, Paris and Bombay.

Cincinnati Aircraft Co.

The Cincinnati Aircraft Co. has been organized under the laws of the State of Ohio and a charter granted for aviation in all its phases.

The object of the company is to establish at Cincinnati one of the most modern aviation fields in the country.

Speedy Flight of the Martin Transport

(*Continued from page 4*)

side wind and at an altitude of 9000 feet over half the distance. The motors were turning over at 1600 r.p.m., which is considerably slower than their maximum. The climbing performance of the plane was also remarkably good, 4000 feet being reached in 6 minutes and 6,800 feet in 13 minutes. The landing at McCook Field was perfect despite the fact that the pilot had never before flown a ship in which he was completely enclosed.

The Martin Co., builders of the plane, point out that this is not their 12-passenger commercial plane but merely an adaptation of the Martin Bomber to be used in the transportation of machine gunners to threatened points or for the inspection of widely separated posts by army officers. However, it is a real departure from the war plane and a genuine step towards commercial aviation.

Log of the Trip

Following is a log of the trip kept by the passengers:

Log of flight between Cleveland, Ohio (Glenn L. Martin Field), and Dayton, Ohio (McCook Field), on Sept. 17, 1919, with U. S. A. Martin Transport (12 passenger):

CLIMB: 3,000 ft. in 5 minutes; 3,500 ft. in 5½ minutes; 4,000 ft. in 6 minutes; 5,500 ft. in 9 minutes; 6,000 ft. in 11 minutes; 6,800 ft. in 13 minutes. Average Climb, 8⅓ ft. per second.

FLIGHT: Left ground at 11:48 A. M. Circled 17 minutes; off on course at 12:05 P. M. Elevation 6800 ft.—100 m.p.h.—Flying above clouds. Over square in 5 minutes, covering eight miles.

1st Report—12:08 P. M. Altitude 6800 ft. Airspeed 95 m.p.h. Water 70 deg. 1600 r.p.m. Flying level—all O. K.

2nd Report—Over Olmstead Falls at 12:14 P. M. 20 miles in 10 minutes. Over Grafton 12:22. Elevation 7200 ft. Getting cool. 115 m.p.h. 32 miles in 17 minutes.

3rd Report—Oberlin to right. 7800 ft elevation. Climbing to get over clouds. Wonderful view. Steering by compass.

LIEUT. JAMES F. WHITESCARVER

4th Report—12:30 P. M. 8000 ft. elevation. Over Wellington. Compass reading 21 deg. South. Over Greenwich 12:40. Shelby 12:48 Elevation 9000 ft. Crestline 12:53.

5th Report—Marion 1 P. M. 105 miles from Cleveland in 55 minutes.

6th Report—Over Owen 1:15 P. M. Elevation 9000 ft. Peoria 1:25 P. M. Urbana 1:30 P. M. Elevation 9000 ft. Over Springfield 1:40 P. M. Large masses of clouds had disappeared. Wilbur Wright Field in view. Rather bumpy. McCook Field in view. Circled over Riverdale, Dayton View, and business district of Dayton. Landed at McCook Field at 1:55.

RESUME: Actual time of flight 1 hr. 50 min. for 215 miles airline. Average speed 117 m.p.h.

Whitescarver for China

Lieut. James Field Whitescarver, who, since his discharge from the U. S. Air Service, has been employed by Gaston, Williams and Wigmore, Inc., of New York, has left for Shanghai, China, where he will have charge of the chemical department established there by the same firm.

Lieutenant Whitescarver, who was one of the most popular junior officers of the Air Service, was born at Hollins College, Roanoke, Va., Sept. 10, 1894, a son of W. O. Whitescarver, professor of mathematics. A few years later the father took up some engineering work for the government and moved to Columbia, S. C. The son was graduated as an A. B. from the University of South Carolina in 1915 and as an M. A. in 1916.

He entered the employment of the du Pont Company as a chemist in the manufacture of gun cotton at Hopewell, Va., in 1916, and in December of that year became an instructor in French and Spanish in the Winston-Salem, N. C., high school. On June 4, 1917, he enlisted in the U. S. ambulance service and was sent to Allentown, Pa. In August he was transferred to the Aviation Section of the Signal Reserve Corps and reported to the ground school of the Massachusetts Institute of Technology. His squadron was sent to Waco, Texas, and he was commissioned as second lieutenant and pilot on March 26, 1918. Lieutenant Whitescarver continued flying in Virginia, Fort Worth, and Mineola until the armistice was signed.

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Peace Treaty Convention Relating to Aeronautics

Annex H, Which Concludes the Report Made by the Aeronautical Commission in Paris

Annex H.

CUSTOMS

General Provisions

1

Any aircraft going abroad shall depart only from aerodromes specially designated by the customs administration of each contracting State, and named "customs aerodromes."

Aircraft coming from abroad shall land only in such aerodromes.

2

Every aircraft which passes from one State into another is obliged to cross the frontier between certain points fixed by the contracting States. These points are shown on the aeronautical maps.

3

All necessary information concerning customs' aerodromes within a state, including any alterations made to the list and any corresponding alterations necessary on the aeronautical maps and the dates when such alterations become valid, and all other information concerning any international aerodromes which may be established, shall be communicated by the States concerned to each other and to the International Commission for Air Navigation which shall notify such information to all of the contracting states. The contracting States may agree to establish international aerodromes at which there may be joint customs services for two or more States.

4

When, by reason of a case of *force majeure*, which must be duly justified, an aircraft crosses the frontier at any other point than those designated, it shall land at the nearest customs aerodrome on its route. If it is forced to land before reaching this aerodrome it shall inform the nearest police or customs authorities.

It will only be permitted to leave again with the authorization of these authorities, who shall, after verification, stamp the log book and the manifest provided for in paragraph 5; they shall inform the pilot of the customs aerodrome where he must necessarily carry out the formalities of customs clearance.

5

Before departure, or immediately after arrival, according to whether they are going to or coming back from a foreign country, pilots shall show their log books to the authorities of the aerodrome and, if necessary, the manifest of the goods and supplies for the journey which they carry.

6

The manifest is to be kept in conformity with the attached form No. 1.

The goods must be the subject of detailed declarations in conformity with the attached form No. 2, made out by the senders.

Every contracting State has the right to prescribe for the insertion either on the manifest or on the customs declaration of such supplementary entries as it may deem necessary.

7

In the case of an aircraft transporting goods, the customs officer, before departure, shall examine the manifest and declarations, make the prescribed verifications and sign the log book as well as the manifest. He shall verify his signature with a stamp. He shall seal the goods or sets of goods for which such a formality is required.

On arrival the customs officer shall ensure that the seal is unbroken, shall pass the goods, shall sign the log book and keep the manifest.

In the case of an aircraft with no goods on board, the log book only shall be signed by the police and customs officials.

The fuel on board shall not be liable to customs duties provided the quantity thereof does not exceed that needed for the journey as defined in the log book.

8

As an exception to the general regulations, certain classes of aircraft, particularly postal aircraft, aircraft belonging to aerial transport companies regularly constituted and authorized and those belonging to members of recognized touring societies not engaged in the public conveyance of persons or goods, may be freed from the obligation of landing at a customs aerodrome and authorized to begin or end their journey at certain inland aerodromes appointed by the customs and police administration of each State at which customs formalities shall be complied with.

However, such aircraft shall follow the normal air-route, and make their identity known by signals agreed upon as they fly across the frontier.

Regulations Applicable to Aircraft and Goods

9

Aircraft landing in foreign countries are in principle liable to customs duties if such exist.

If they are to be re-exported they shall have the benefit of the regulations as to permit by bond or deposit of the taxes.

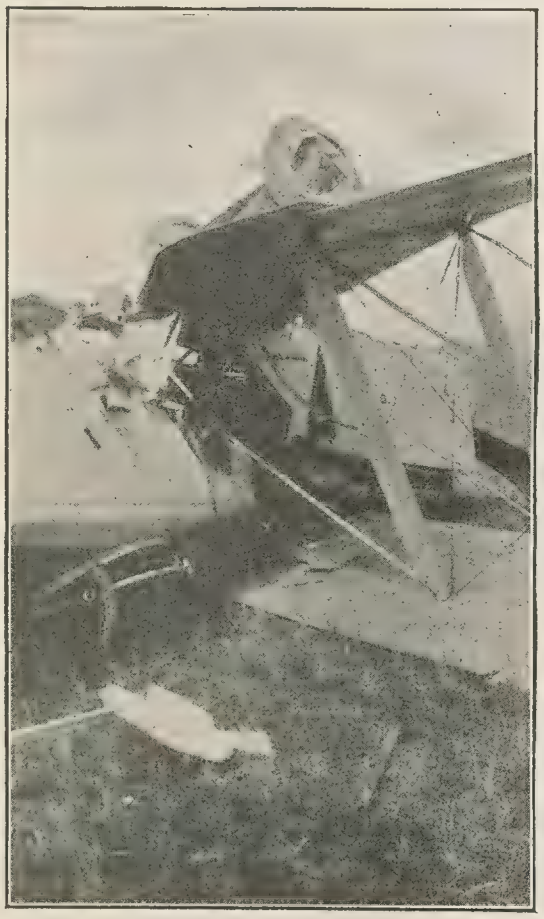
In the case of the formation between two or more countries of the Union of touring societies, the aircraft of the said countries will have the benefit of the regulations of the "Tryptique."

10

Goods arriving by aircraft shall be considered as coming from the country where the log book and manifest have been signed by the customs officer.

As regards their origin and the different customs regimes, they are liable to the regulations of the same kind as are applicable to goods imported by land or sea.

(*Continued on page* 14)



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Formerly Air Service Journal

Possible Delay

SO that the readers of the AIRCRAFT JOURNAL may know the situation regarding the possible lateness of future issues reaching them, it is only necessary to refer to the possibility of a strike in the New York printing trades. If this condition should arise it may cause a delay in the publishing dates.

The Mockup!

"MOCKUP " is a term which still sounds somewhat strange to aeronautical men, but it is quite obvious that no planes will be built in the future on an experimental basis without the construction of a " mockup " or a fuselage roughly constructed but embodying the main features of the actual airplane.

In the early days of aeronautical construction, ships were built with scarcely any drawings. Having determined what motor he would use, and obtained a fair idea of the main dimensions of his airplane, the constructor would proceed to his shop, confer with his foremen, and start in to build. He would determine structural dimensions roughly by eye, and build very quickly. This method produced on the hit-or-miss principle worked fairly well on the whole, and some of the best of the early machines were constructed in this way.

With increasing technical knowledge, with the training of more aeronautical draftsmen, the pendulum swung the other way, and factories began to turn out vast quantities of detailed drawings for purely experimental jobs, long before anything was started in the shops.

There is assuredly a *via media,* which constructors now are following for the most part. A serious technical study of the plane is made, enough drawings are made to give a real start in the shop, but prints are limited to essentials. Then a mockup is made which carefully reproduces all the main features of the fuselage, and enough of the wings to determine vision, clearance and so forth. From the inspection of this corrections are made, drawings revised with a fair assurance of permanency.

The " mockup " becomes an integral and not the least important part of the design work.

Fabric Fastenings

DURING the war, supposed fabric failures occurred on the Bristol and De Haviland planes, causing something like consternation in aeronautical circles.

According to the most careful computations of distributed loading on the plane, and the most painstaking tests of the fabric itself, the linen covering of the wings had apparently a higher factor of safety than any other part of the airplane; nevertheless as a result of these failures, heavier and strong fabrics were used, and ribs brought closer together, particularly in the slip stream of the propeller; factors of safety close to 15 or 16 were finally obtained. Still matters did not appear to be completely satisfactory.

An interesting publication of the National Advisory now discloses the exact point of weakness, which was not in the fabric itself but in the poor method of attaching the fabric to the wing. Failures were not fabric failures at all, but were caused by the lacing cords pulling through the upper fabric and by failure of the lacing cords due to chafing.

The total load on an area of fabric defined by the distance between lacings and the width of a bay, was in this method of attachment concentrated on a very small area of fabric defined by the bearing surface of the lacing cord. Factor of safety at the lacing points was thus extremely low and conditions of abnormal flight tore the fabric at the places of support, particularly when the conditions were exaggerated by high vibratory stresses.

The Bureau of Standards suggested a method of attachment which seems to have removed the difficulty completely. A corded tape was put on the surface of the fabric along the rib, so doped that a good bond existed between the fabric and the tape. The lacings were then placed over the cord tape at intervals of not more than 4 inches. The wind friction was placed above this. This method of reinforcing has been tried out in service tests with complete success.

Besides constituting a valuable, practical lesson in itself, the investigation emphasizes the importance of the utmost care not only in the broad lines of a design, but in all its minutiæ.

Commercial Flying

REVIEWING some recent exploits in aeronautics in America the New York *Tribune* says:

" It is apparent that the commercial development of aviation is progressing with marvellous speed. A recent report of the American Aviation Mission contains an account of a plan being considered in England for a transatlantic airship line for mail service that would make it possible for a letter written in London to be delivered in San Francisco five days later. Such an achievement, so beyond the bounds of reason a few months ago, does not appear so fantastic now that the Atlantic has been crossed four times by aircraft without the loss of a single life. There are now being built in England aircraft that will carry from five to ten tons of mail, in addition to the necessary fuel and crew. These airships will cross the Atlantic from London to New York in half the time required by the fastest steamship.

" Already commercial flying has made considerable progress in Europe. Reports have reached London of several air lines having been started in Germany, and considerable has been done along the same line in both England and France. A daily service from Paris to London has been in operation for some time. Other lines are operating from Paris to Lille and Brussels, and from Paris to Alsace-Lorraine and to points in occupied German territory.

" Private English interests have now under process of formation companies to install aerial lines from Cairo to the Cape and from Cairo to Bombay, and the French, not to be left behind, will soon be operating lines of airplanes to Morocco and Algiers. These lines will carry passengers, mail and express.

" It is now a year since the United States Post Office Department inaugurated mail service between New York and Washington with such signal success that the per cent of deliveries at each end averages nearly 100. A Chicago-New York mail service was established later and is in regular operation. The government, it is announced, will soon put into operation a two-day mail service between New York and San Francisco."

It is much to be regretted that American progress has not kept pace with Europe, but there still is hope that America may wake up.

Mrs. Rinehart Not Afraid — Not for a Moment

Famous Author Tells the Story of Her First Flight, with Its Thrills and Pleasures

Mrs. Mary Roberts Rinehart, the Well-Known Author, About to Make Her First Trip in the Air in a Plane Piloted by Emery H. Rogers

A new thrill has been experienced by Mary Roberts Rinehart, noted author and traveler, who is now in Los Angeles, Cal., supervising the filming of some of her famous stories. She has flown in an airplane, making her first flight recently in a plane piloted by Emery H. Rogers, of the Syd Chaplin Aircraft Corp., California, distributors for the Curtiss Aeroplane and Motor Corp. Her impressions are best told by Mrs. Rinehart herself:

By Mary Roberts Rinehart

The most amazing thing about flying to me was not that I was actually flying. It was that I was not afraid. Not for a moment.

I was curious, interested, just a little bit proud of myself and inclined to patronize those plodders down below who made such slow progress along the threadlike roads, but afraid—no.

It is all so easy. Some highly efficient person offers you a helmet and a pair of goggles—why don't we use these helmets in our motor cars?—and a leather coat too large and not extremely becoming to wear over one's riding breeches, and a photographer gets a sort of ladder and waits to catch you crawling into the—I think they call it the fuselage.

You hope you are doing it gracefully, but the toe of your right foot catches on the pit, or whatever it is you sit on, and during the desperate struggle to release it you hear the camera click.

Then a perfectly calm young man with a cigarette, after suggesting that you have your helmet on wrong side before, crawls into the seat in front of you and takes a squint into the sky. It develops that he is picking out a hole in the clouds to go through, precisely like locating the cup on the putting green, and from the ease with which he strikes it later, considerably easier to hit.

"What a Day for a Spin"

The young man was quite easy. He wasn't making a last will and testament. He didn't kiss any one good-by. He put on his goggles and got in and started the engine and the very back of his head said: "Oh, boy, what a day for a spin!"

I use the word spin advisedly, because later on, far above the clouds and in that most wonderful No Man's Land of all, he shut off the motor and turning round asked me something.

I did not hear, but considering that he had probably asked if I liked it, I nodded my head vigorously, "Yes."

It seems, however, that he had asked me if I wanted to do any stunts. We did some. Overcoming my first surprise at feeling my airplane roll entirely over like a dog, I was ready to do it again. And we did. I am not a brave woman. I do a lot of things I am afraid of largely because I am afraid. I hate to feel that I cannot do what other people can. And there is a curious and most unexpected sense of security in the upper air.

There is no sense of vertigo, and I believe this is the common experience. Yet I cannot look down from a high building, and I suffer tortures on those so-called scenic railways at amusement resorts.

It is a great big new experience, this taking the air. To look down at the clouds instead of up. The old earth has a new beauty. Oddly enough, it is restful, too.

A Gentleman's Sport

I am convinced that not only is flying a gentleman's sport, but that we will soon have an airplane in the back yard or on the roof, and what is more, that women will drive them as they do motor cars now. In a practical sense, they will be extremely valuable as time savers also. For example, I am flying to San Diego today; my motorcar also will leave at the same time, but I shall arrive several hours ahead of it, clean instead of dusty, calm with the calm of open spaces, and rested. If I were not afraid of missing something I should probably sleep.

This does not sound like the nerve-racking experience that flying is supposed to be, does it?

Aerial Photography

It is difficult to list fully the applications that can be made of aerial photography outside of the Army, because this branch of photography is so new and its range of usefulness so extensive that almost daily someone thinks of another field in which it can be employed. It is equally difficult to decide in which activity it is most valuable.

Important Work for Air Service

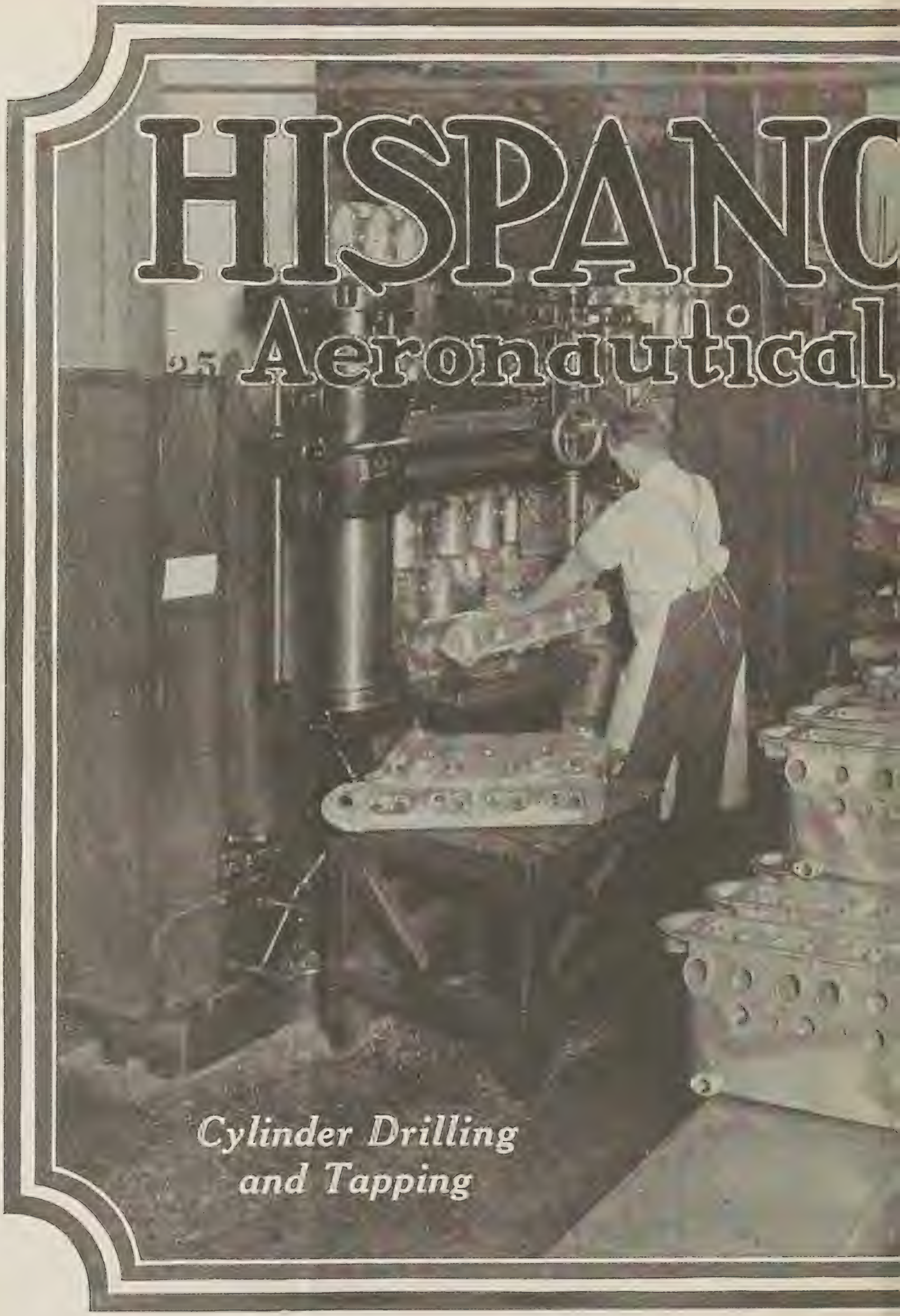
The vertical aerial photograph, made from a high altitude, resembles a portion of a map so closely that it was natural that aerial mapping should be thought of first as one of the fields, not confined to military operations, in which aerial photography can be used with profit. This field is tremendously large. If Congress were to decide to have the necessary and important work performed of mapping the United States from the air, this job alone would keep an Army air service, several times the size of the present one, busy for many years. Undoubtedly the project would be one of the most useful of army peace time training activities. While employed upon the work, the air forces would not only be receiving valuable training, every part of which would be necessary and nothing superfluous, but would at the same time be performing work that should not be delayed longer by the United States if it means to keep pace in this regard with other nations. Thus, those that demand that in peace time an army be as productive as possible can be appeased by this mapping work upon which the Air Service can engage with great profit to the country and to everyone concerned.

Surveying and Mapping

Since the signing of the armistice has made it possible, the army has been developing special apparatus for aerial mapping. One by one the difficulties that have interfered with the making of the most suitable photographs for mapping purposes have been overcome. Larger cameras, covering greater areas on the ground and using film that permits the making of hundreds of exposures, constitute one of the new developments.

An area is mapped from the air by flying over it, making the while enough photographs to form a composite picture of the tract. This composite photograph, when mounted, is known as a photographic mosaic or map. Aerial surveying possesses many distinct advantages over land surveying. If it is attempted to make a land survey of marshy areas, thinly wooded tracts or other practically impassable regions it will be found that land surveying is not only difficult and hazardous, but very expensive on account of the amount of time required. To accomplish the same amount of work it is merely necessary for the airplane to move swiftly in the free air over these impassable regions and with camera attached make a record so perfect that it would be impossible for the land surveyor to draw a duplicate in all its detail. Meanwhile the land surveyor would consume days and months while the same area could be mapped from the air in a few hours.

The progress made in the construction of engineering projects, such as buildings, canals, railways, as well as the comparative merits of various types of city planning, can be better shown by aerial photographs than by any other means.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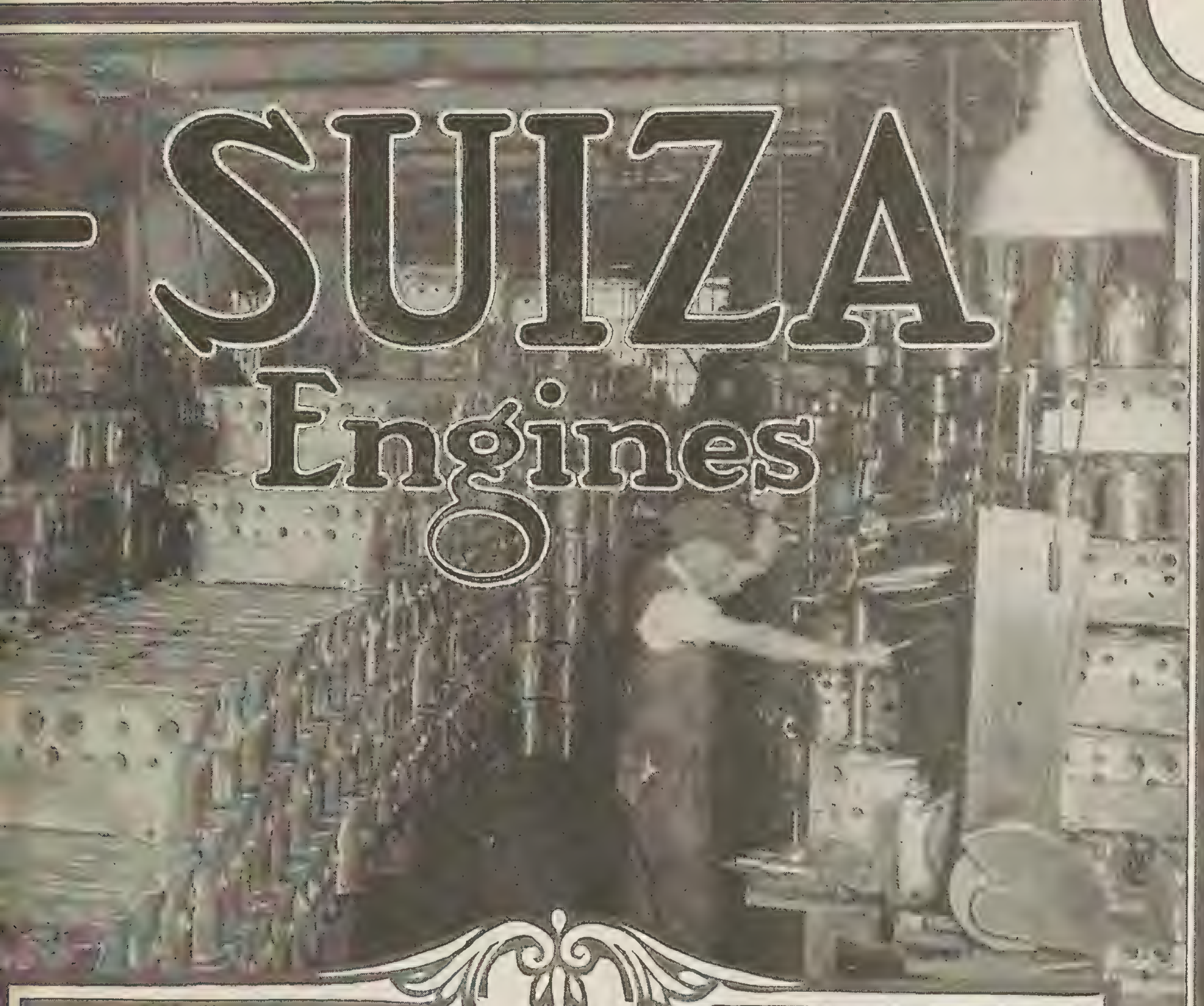

"The Motor that made the Spad possible"

EACH operation, however insignificant, is an important mile-stone in the fabrication of Hispano-Suiza Aeronautical Engines.

It follows then that correct engineering principle and design receive their greatest opportunity—exemplified innumerable times in this great motor's war-time performance.

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Aircraft Corporation
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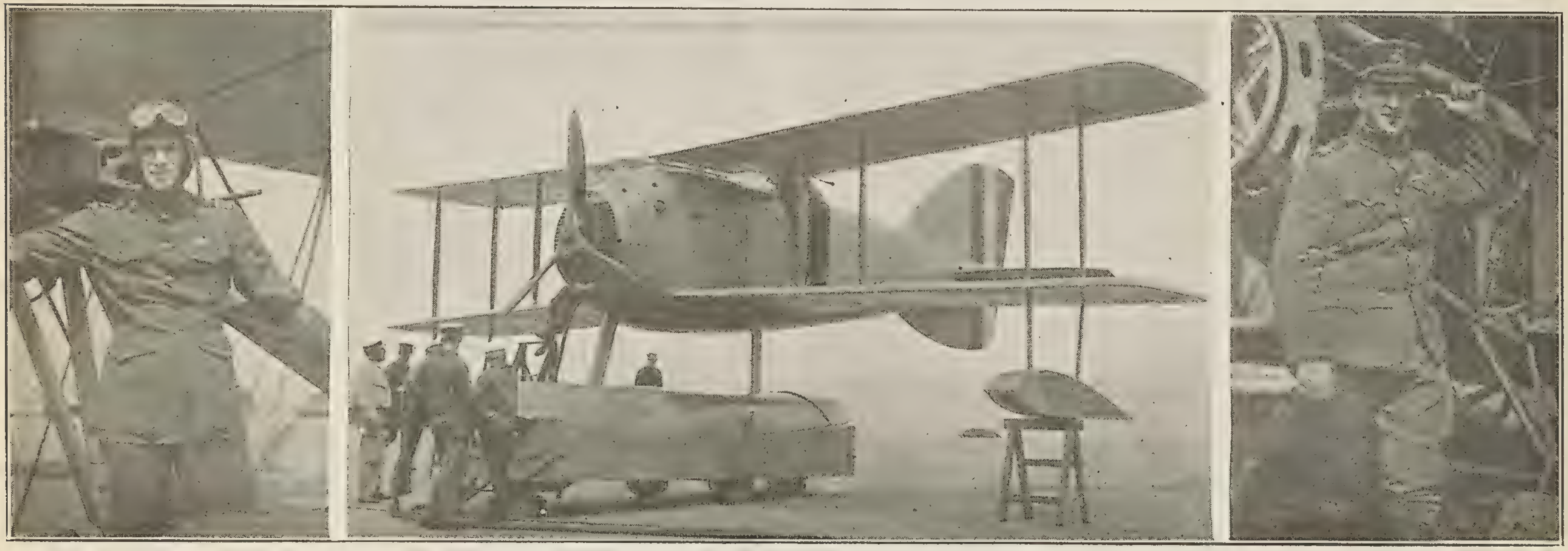
Naval Air Service Greatly Expanded by War

American Naval Air Forces Second Largest of All Allies at Time of Signing of Armistice with Teutonic Enemies

Although its origin was almost insignificant, the United States Naval Air Service was expanded so rapidly during the war that when the Germans quit it was the second largest naval flying force in the world. Development of the service, hitherto a carefully guarded secret, was disclosed recently by the Navy Department in the first of a series of announcements dealing with naval aerial activity since April, 1917.

When the United States entered the world conflict it maintained a small naval aerial establishment, with the principal station at Pensacola, Fla. The personnel at that station was thirty-eight aviators and 163 enlisted men and the equipment consisted of twenty-two seaplanes, five kite balloons and two free balloons.



Lieutenant-Commander N. H. White, Jr., One of the Navy's H-A Fighters, and Lieutenant L. T. Barin

An expanded air service was organized immediately and the various bureaus took up the work of providing men and equipment. The Bureau of Steam Engineering took charge of the development and manufacture of motors and radio equipment; the Bureau of Construction and Repair dealt with the hulls and wings of the planes; the Ordnance Department provided machine guns and bomb launching devices and thousands of tons of high explosives and the Bureau of Navigation supplied and trained thousands of officers and enlisted men.

The armistice found the Navy with more than 1,500 aviators, 1,300 ground officers, and 35,000 enlisted men with 4,000 flight officers and 10,000 enlisted men in training. There were in commission 1,400 seaplanes and airplanes and about 300 lighter-than-air craft of all types. More than 1,200 officers and 19,000 enlisted men, together with 388 seaplanes, 140 airplanes and 42 kite balloons, were sent to the war zone.

Meantime the single station maintained in the United States prior to the war had grown to seven training stations, ten patrol stations, nine rest and refueling stations, two experimental stations and a number of additional stations for various purposes were under construction. They formed a girdle that encircled the entire seacoast of the country. In Europe there were established and in operation twenty-eight American naval flying stations, two training stations and twelve bombing stations located in England, Ireland, France and Italy. There also was a Marine aviation station in the Azores.

A capable administrative force, drawn by the Navy from civilians, administered the affairs of the service with great success, but regular Navy officers were in direct charge. Technical and manufacturing experts of international reputation represented the Navy at the bases abroad and in this country. Their loyal services with those of the fliers, made possible the achievements which brought from Admiral William S. Sims the following praise for the work of the naval aviation service in the war:

"Please express to the naval aviators of America my most sincere appreciation of their courageous and loyal performance of duty at home and abroad throughout the war. Their brilliant exploits, their determination to win, will ever remain one of the highest tributes to American manhood. The performance of duty of these young naval aviators under my command has not only been in keeping with the very best traditions of our naval service, but has in addition won for America the enthusiastic praise of her Allies."

The American naval aviators carried out joint patrols with the British, French and Italian naval air forces, raiding enemy submarine bases and aircraft bases at Ostend, Zeebrugge, Bruges, Helgoland, Pola, Trieste and various other points. Large quantities of planes, submarines, materials, buildings, hangars, supply stations, ammunition dumps and other valuable military projects were destroyed.

Seaplane patrols and aerial convoys were particularly successful. After the installation of American seaplane patrols and during thousands of miles of convoy, only one ship in such convoys protected by seaplanes was ever successfully attacked. In the ten months American patrols were active only three ships were lost in the entire area between Penmarch and Isle d'Yeu.

British, French and Italian official records give the American naval aviation forces credit for attacking 95 per cent of all submarines sighted while on patrol, in spite of terrific weather conditions at times, and of damaging 45 per cent and sinking 25 per cent of all those attacked. The exact number of submarines sighted, attacked and sunk cannot be made public until the compilation of figures contained in allied records is completed.

Municipal Landing Fields

In line with the policy of the Air Service, Lieut. J. H. Sullivan appeared before the 20th Annual Convention of the Pennsylvania League of third-class cities recently. This league is composed of thirty or more cities of Pennsylvania, having a population of over 10,000.

Lieutenant Sullivan selected as his subject the advisability of municipally owned landing fields, speaking of the advisability of placing the name of the town on the roof of their railway station, the advantages of a municipal map for use in the assessor's department. The value of a municipal aerial photographic map for use in the assessing department was explained by the statement that all natural advantages and real estate improvements, municipal and private, were very plainly shown on such a map. The appraising of valuation of property in a municipality could thus be more fairly made.

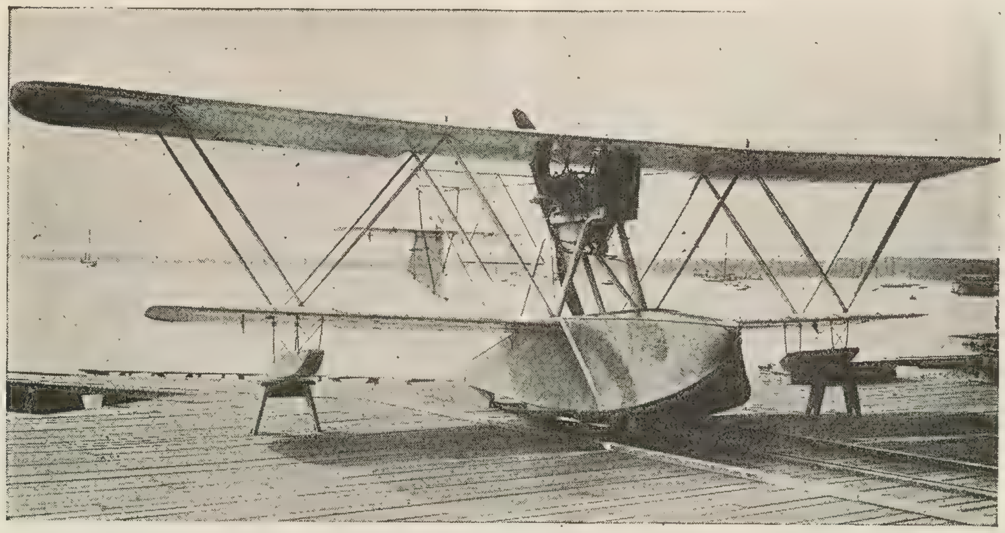
A definite plan of operation was adopted by the Convention whereby each city interested, through the administration of the Mayor, would form a committee on aviation in their respective communities. The functions of this committee would be to select a landing field and devise ways and means to maintain it; to arouse public interest in the development of commercial aviation, using their community landing field as an operating center. Among the cities represented at the Convention was Scranton, Pa. It will be noted that Scranton is the site of the main field on the Lackawanna Air Trail, which was opened recently by the Scranton Aero Club, with the co-operation of the United States Air Service.

Free Balloon Over City

The first flight of a free balloon over New York City was successfully accomplished recently by aviators from the Rockaway Naval Air Station. The balloon, which left Rockaway and was forced to land after a six-hour flight on account of rain at Arcola, N. J., made the trip for the purpose of scattering enlistment circulars to obtain recruits for the Navy. The balloon is the largest type of free balloon used in the navy and has 35,000 cubic feet of gas.

The members of the crew who took the flight were Ensign L. Kloor, commanding pilot; Lieut. Commander J. C. Monfort, Ensign C. M. Johnson, and Ensign J. E. Dyer. The balloon kept a constant altitude of 1,500 feet over the city and flew directly over the U. S. S. Recruit in Union Square. This type of balloon was used during the war to train lighter-than-air pilots and teach them how to handle a dirigible when unaided by the motors.

The newest Vought Product, Model VE-10 3-Place Flying Boat—



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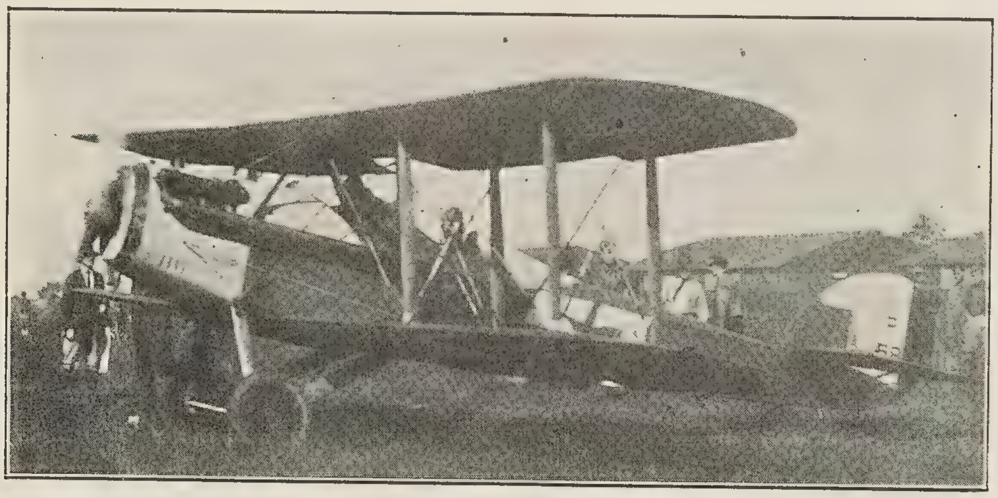

¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

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WEBSTER AND SEVENTH AVENUES
Long Island City, New York

Peace Treaty Convention for Aeronautics

(*Continued from page 7*)

11.

With regard to goods exported in discharge of a temporary reeciving or bonded account or liable to inland taxes, the senders shall prove their right to send the goods abroad by producing a certificate from the customs of the place of destination.

Air Transit.

12.

When an aircraft to reach its destination must fly over one or more contracting States, without prejudice to the right of sovereignty of each of the contracting States, two cases must be distinguished:—

1. If the aircraft neither sets down nor takes up passengers or goods, it is bound only to keep to the normal air route and make itself known by signals when passing over the points designated for such purpose.

2. In other cases, it shall be bound to land at a customs aerodrome and the name of such aerodrome shall be entered in the log book before departure. On landing, the customs authorities shall examine the papers and cargo, and take, if need be, the necessary steps to ensure the re-exportation of the craft and the goods or the payment of the dues.

The provisions of paragraph 9 (2) are applicable to goods to be re-exported.

If the aircraft sets down or takes up goods, the customs officer shall verify the fact on the manifest, duly completed, and shall affix, if necessary, a new seal.

Various Provisions.

13.

Every aircraft during flight, wherever it may be, must conform to the orders from police or customs stations and police or customs aircraft of the State over which it is flying.

14.

Customs officers and excise officials, and generally speaking the representatives of the public authorities shall have free access to all starting and landing places for aircraft; they may also search any aircraft and its cargo to exercise their rights of supervision.

15.

Except in the case of postal aircraft, all unloading or throwing out in the course of flight, except of ballast, may be prohibited.

16.

In adition to any penalties which may be imposed by local law for infringement of the preceding regulations, such infringeemnt shall be reported to the State in which the aircraft is registered and that State shall suspend for a limited time, or permanently, the certificate of registration of the offending aircraft.

17.

The provisions of this Annex do not apply to military aircraft visiting a State by special authorization (Articles 31, 32, and 33 of the Convention), nor to police and customs aircraft (Articles 31 and 34 of the Convention).

Thanksgiving Day Race

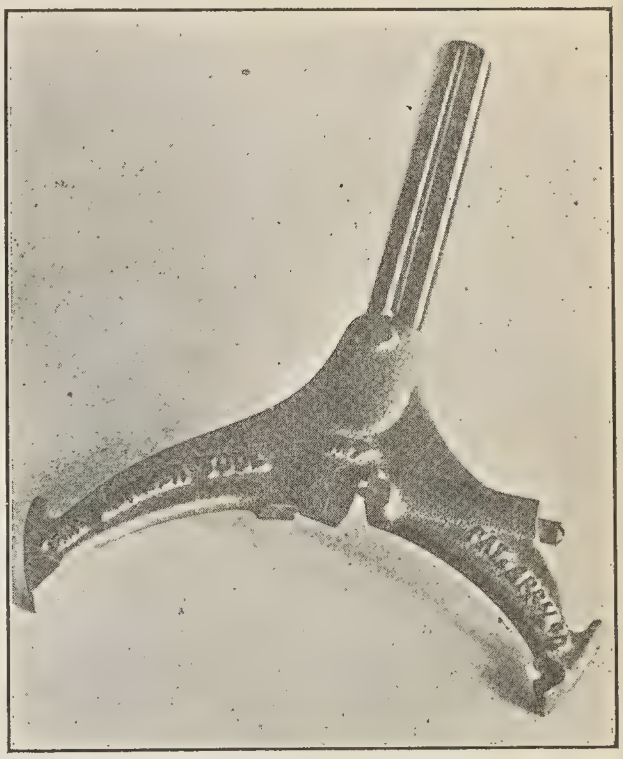
On Thanksgiving Day the Curtiss Southwest Airplane Co. intends to put on a big race from Tulsa to Dallas, Texas, by way of Oklahoma City, Okla.; Lawton, Okla.; Wichita Falls, Texas; Ft. Worth, Texas, and Dallas and return. The distance is about 1,000 miles. The Chambers of Commerce in these towns are co-operating in every possible way and expect to obtain through popular subscriptions a sum of money aggregating $25,000 to be donated as prizes. This trip will be governed the same as the New York-Toronto Race. About 50 machines are expected to compete.

Another Loening Record

Lieut.-Comdr. Edwin Macdonald was erroneously reported as seriously injured in making a forced landing in a Loening monoplane at Philadelphia. He was only slightly injured, and is now fully recovered. Lieutenant-Commander Macdonald made the flight between the Statue of Liberty and Philadelphia City Hall in twenty-nine minutes, the fastest time for the distance yet recorded.

Regrooving Tool

This cut illustrates one of the tools for regrooving. The device is wired to the piston and turned around so that the cutter removes the high spots. This tool would seem to have some utility in the fitting of piston rings.



Regrooving Tool

The Ultra Modern

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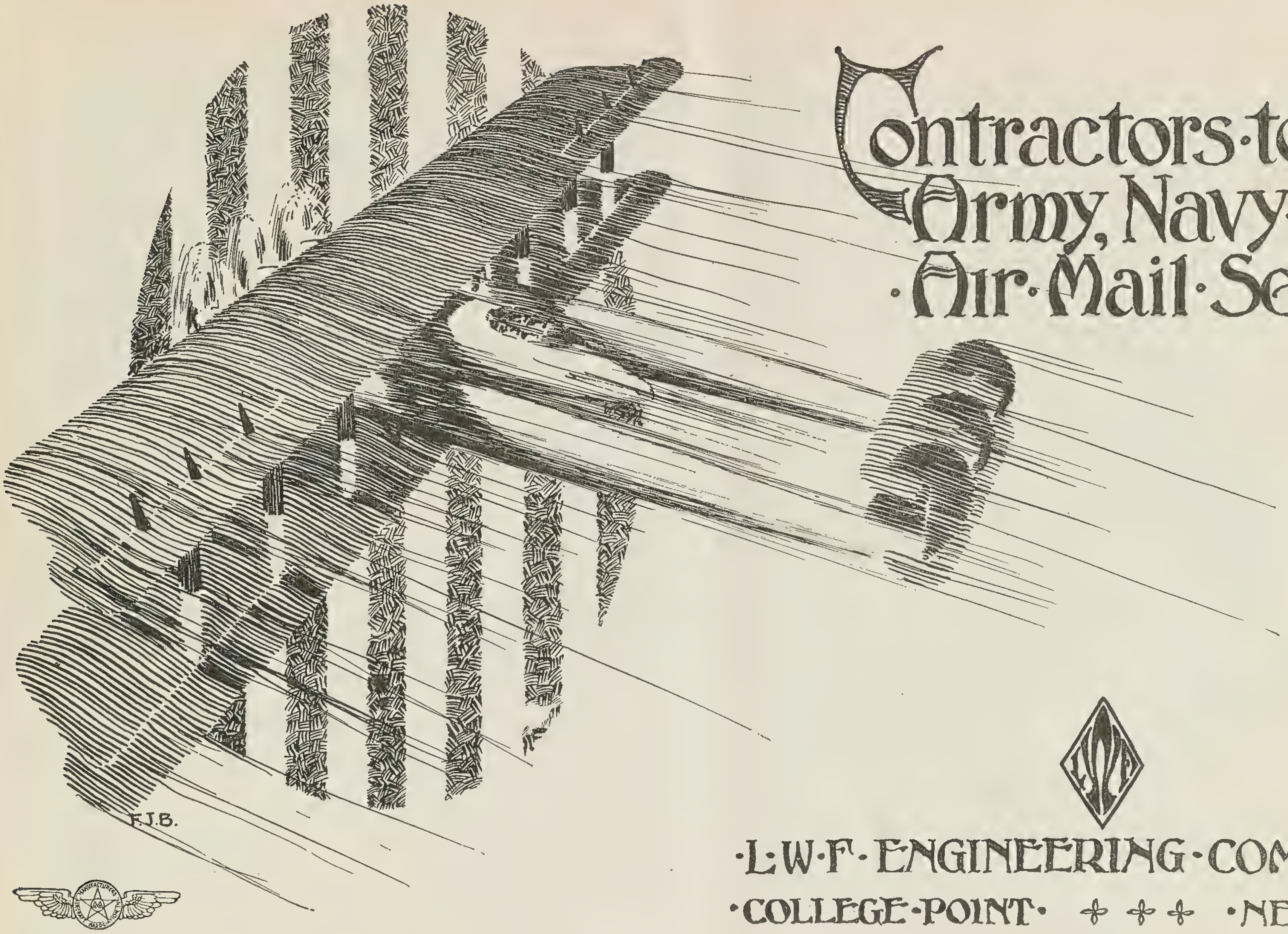

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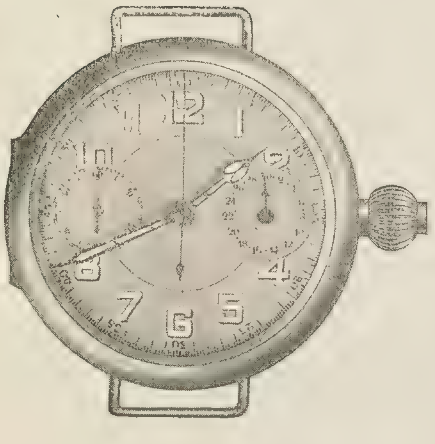
WRIST CHRONOGRAPHS

PLAIN AND LUMINOUS DIALS

ILLUSTRATION SHOWS



No. 123714C.

CHRONOGRAPH ACTUAL SIZE

The only practical "Aviators" split wrist chronograph. 18 jewels. Sterling silver case. Hands and figures treated with a special two year guaranteed radium material passed by U. S. Gov. Furnished with special "Aviators" wrist strap. Suitable for wearing outside of coat sleeve. Price, Net, $60.00

While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

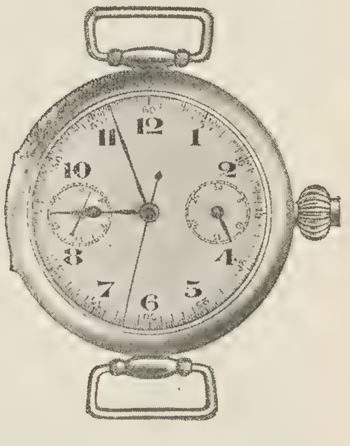
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS



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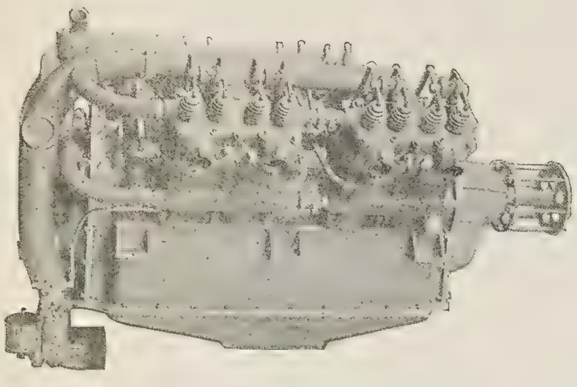

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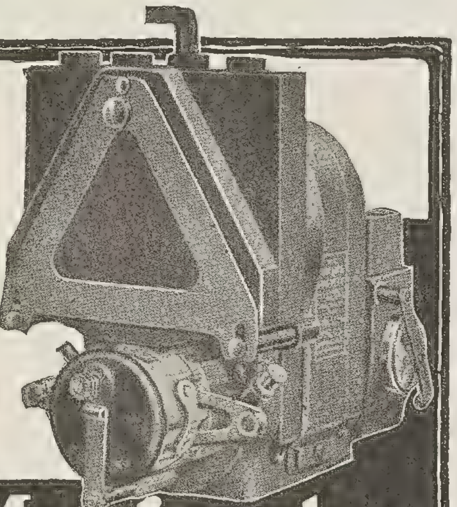

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THE FUTURE OF FLYING
DEPENDS ON RELIABILITY

THE FOLLOWING NOTABLE PERFORMANCES STAND TO THE CREDIT OF

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(1) The first and only direct **ATLANTIC FLIGHT** by aeroplane. Vickers-Vimy bomber with **ROLLS-ROYCE Engines**

(2) The only two flights from **ENGLAND TO INDIA**. Handley-Page machines with **ROLLS-ROYCE Engines**

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THE BEST IN THE WORLD

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Curtiss

There's Money in the Air

They say "Opportunity knocks once at every man's door."

'Tis knocking now at the door of every aviator while hundreds of young men are training for the commercial end of aeronautics.

And flying *is* now a business, although, first of all, it was a sport so full of sensation, adventure and thrill as to appeal to red-blooded men the world over.

But now the "bird of wood and iron" has got down to business and is "doing its bit" in the workaday world.

Here, for example, are some aircraft-activities of which many people do not know:

Commuting
Taxi-Service
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Flights for guests at hotels and summer resorts
Campaigning
Selecting Land Sites
Oilfield Survey
Carrying Pay-rolls
Delivering Fresh Fish
Civic Planning
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Flying Contests
Film Delivery
Aviation Schools
Transportation of Government Officials
Laying out Logging Routes
Mail Carrying
Forest Fire Patrol
Aerial Photography
Making Motion Picture Films
Ranching
Missionary Work
Commercial Traveling
Delivering Clearing Papers
Fire Surveys
Carrying Prisoners
Visiting Remote Points
Railroad Survey
Passport Delivery
Aerial Prize-contests
Chamber of Commerce Reports
Carrying Samples of Minerals and Timber
Aerial Advertising
Astronomical Observation
Emergency Medical Service
Marketing Garden Truck
Sheep and Cattle Herding
Scouting for Market-fish
Soliciting Towing Business
Surveys of Docking
Delivery of Perishables
Flying Circuses
Machine-part Delivery
Polar Exploration
Baseball Transportation
Ambulance Work
Wheatfield Survey
Air Exploration
Boundary Patrol
Real Estate Survey
Carrying Precious Ore
Quick Delivery of Merchandise
Fur-carrying
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No. 150

V #15

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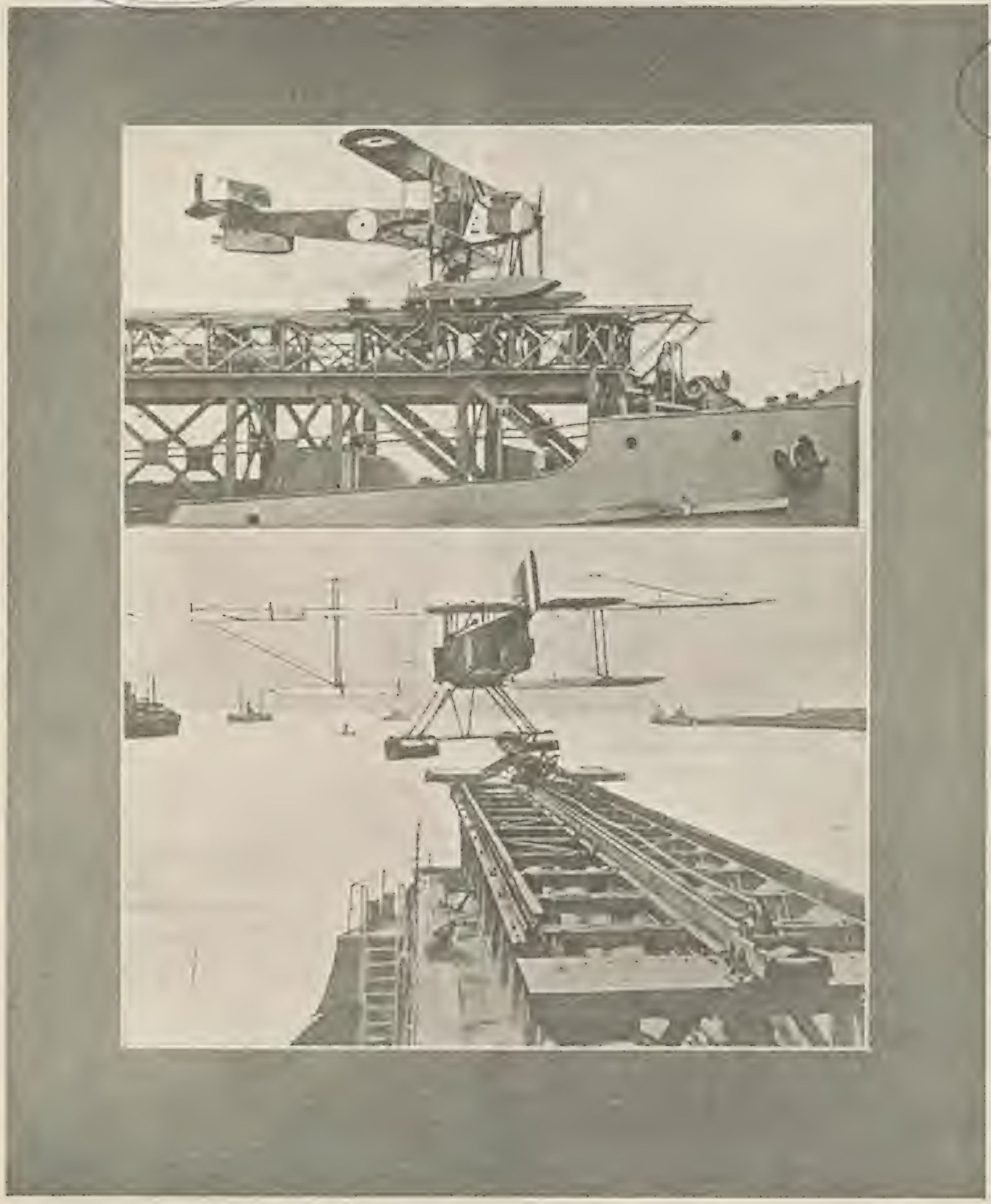
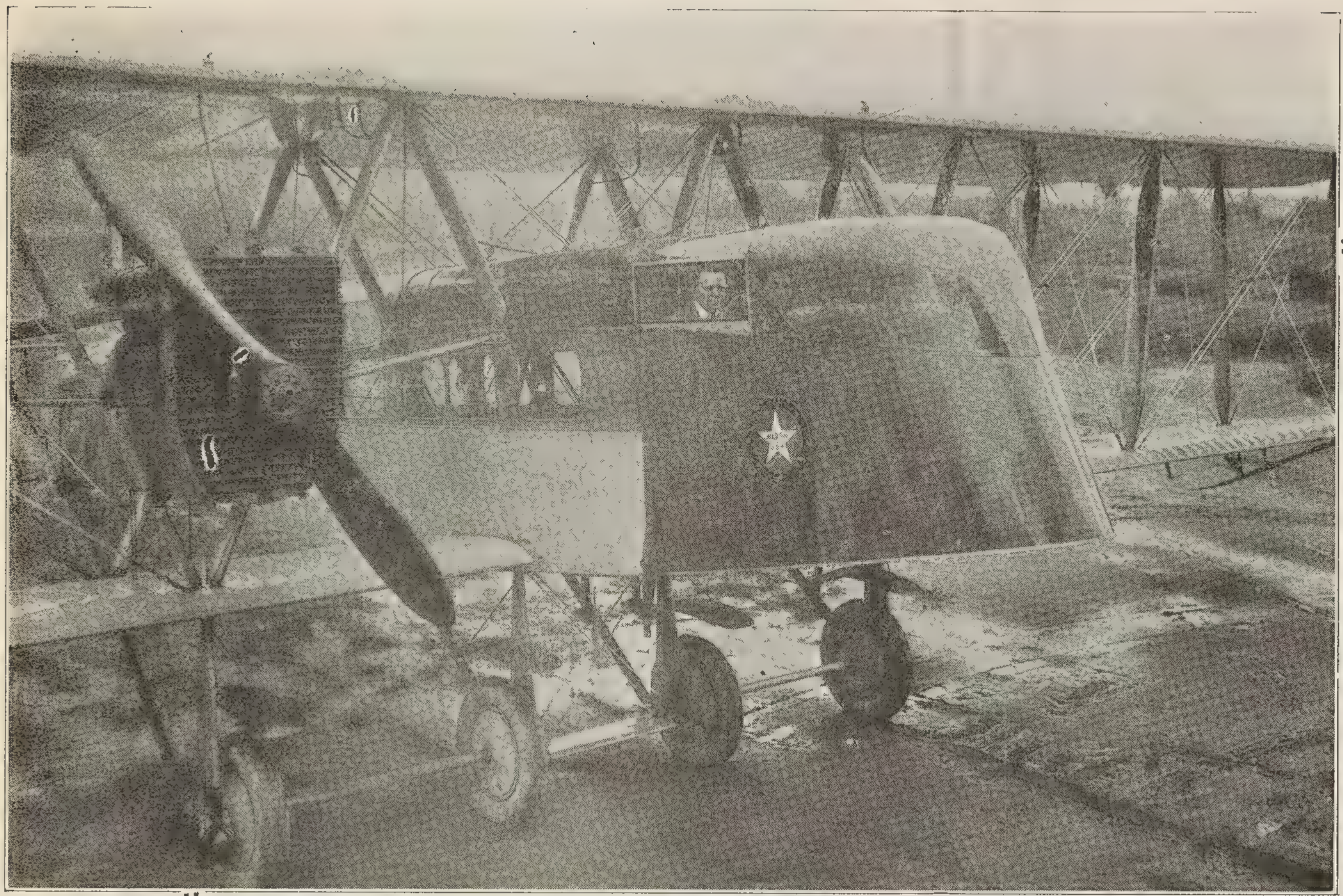


Photo International Film Service.

Launching a Seaplane from a Ship's Deck by Catapult

Launching of a Seaplane from a Platform on the Deck of H.M.S. Slinger by Means of a Catapult Operated by Compressed Air. Upper Photo: A Machine in Position on Board the Sliger. Lower: The Seaplane Launching-Platform.

Owing to the General Strike of the New York Printers, This Issue Was Printed in a Rural Newspaper Office.



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The U. S. Martin Army 12 Passenger Transport Plane

First in War

Commercial Aviation
Has These Essential Requirements

1. Safety and Dependability.
2. Comfort and Capacity.
3. Speed and Endurance.

These attributes are built into every Martin airplane.

The Martin 12 Passenger Airplane

Will dominate the commercial field just as the MARTIN BOMBER has demonstrated its military supremacy.

MARTIN U.S.A.

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CLEVELAND

Contractors to the United States Government

First in Peace

Maynard Quickly Takes the Lead

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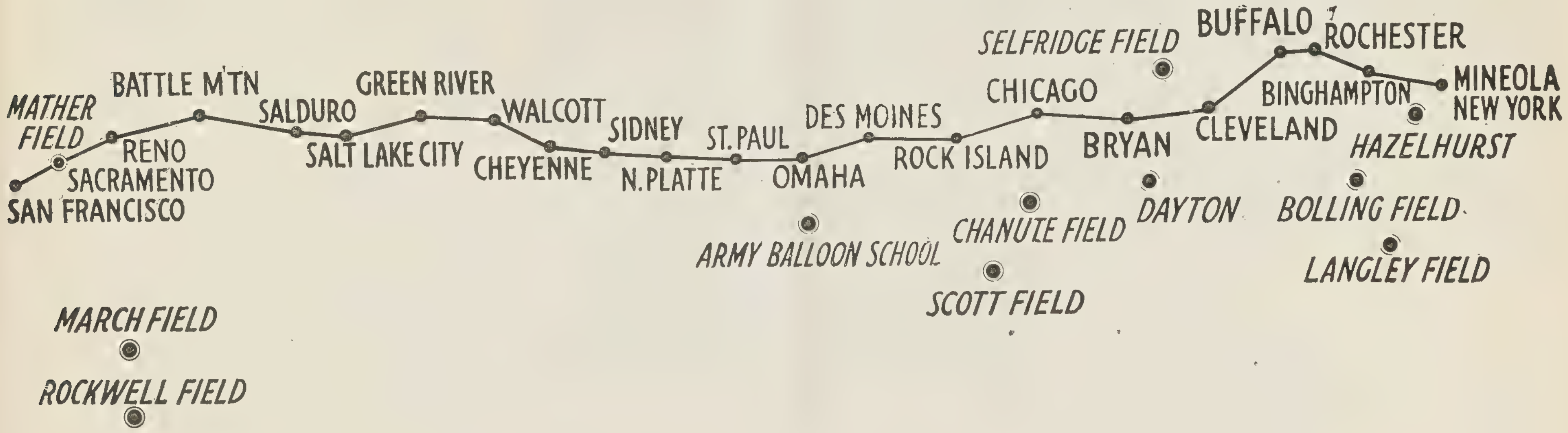
Sixty-Three Intrepid Fliers in the Great Transcontinental Airplane Race



Route of the Transcontinental Reliability Contest.

Two thousand people saw forty-seven airplanes start on the East-to-West section of the world's greatest air race at Roosevelt Field L. I., October 8.

In crisp, clear weather, the contestants got away in rapid succession without a flaw in the starting arrangments. A group of society women headed by Mrs. W. K. Vanderbilt, jr., bade each of the pilots godspeed as they left the starting line.

The first machine to take off was No. 17. a De Haviland 4, piloted by Lieutenant J. B. Machle, with Sergeant Jesse D. McClure as observer. The wheels of his machine left the ground at 9:10:05 amid cheers that almost drowned out the roar of his 400 hp. Liberty engine. He was started by Assistant Secretary of War Benedict C. Crowell and Brigadier General William Mitchell.

Maynard Ninth to Start

Lieutenant Belvin W. Maynard, the "sky pilot" aviator, winner of the Toronto race, was the ninth contestant to leave. He was the first racer to reach Chicago landing there at 5:53 P. M. Maynard took off from Roosevelt Field at 9:24:56.

The elaborate arrangements for the start of the race had to be abandoned at the last moment and it was hastily decided to send all the odd-numbered contestants away in the morning and the even numbers in the afternoon.

The British Air Attache, Air Commodore L. E. O. Charlton, who was to have been the first starter, was delayd by a minor fault and was the tenth to get away. He was flying a Bristol fighter equipped with a Rolls-Royce engine.

During the first hour thirteen machines took off for the 5402-mile race across the continent and back. On two occasions during the day the contestants were sent off with such rapidity that four of them were in the air close together with only a few seconds separating them.

Second Lieutenant Barney M. Giles acted as official timekeeper for the Army, and Cole J. Younger performed the same function for the American Flying Club which is officially reporting the race for the United States Air Service.

One All-American Plane

The only thoroughly American designed, constructed and engined ship left the field at 1:35:53 o'clock. This was the twin-engine Martin bomber piloted by Capt. Roy N. Francis, who has been flying since 1903. The giant ship carries a crew of five men, and is equipped with two Liberty engines with an aggregate of 800 horsepower.

Throughout the day the band of the Twenty-second Infantry played popular airs. At eleven o'clock in the morning Brig. Gen. William Mitchell of the U. S. Air Service took off in an SE-5 and for thirty minutes entertained the crowd with a series of wonderful stunt flying. In the afternoon Captain Field Kindley the second ranking American ace, performed aerial stunts.

Purpose of Race Explained

Immediately after landing General Mitchell, speaking of the race, said:

"It is really a manoeuvre to see how rapidly we can get aerodromes across the the continent, to find out how quickly we can get a serviceable meteorological system of reports organized for such service, to ascertain how the supply department will function in supplying fields and how far we can rely on civil cooperation in preparing the fields.

"There is one important fact that should be emphasized. The equipment used in this race consists of machines designed for military operations on the Western front. That is for short distance work. They are now flying across the continent.

"During this flight they will have to fly for four hundred miles over the country that lies at a mean altitude of six thousand feet above sea level. This will give us important data upon the performances of the different types under those conditions.

"It is all being done with the idea of seeing how quickly we can shift our aerial forces from one coast to the other in case of attack on either border.

Urges Separate Air Service

"We believe that this country with its resources, its personnel and its manufacturing possibilities would be better aided in aerial development under a single air service. A separate air service is more of an asset for national defence and economic development than any other new thing before the country.

"Those are the general objects of this transcontinental test. We are going to assist in commercial aerial development because we are convinced that only in that manner can we keep a sufficient source of manufacture. With an air service there is no coast line and we are just as liable to be attacked in the Middle States as along the coast."

Throughout the day the departing aviators were fed with sandwiches and hot coffee by volunteer workers from the War Camp Community Service of Queens County.

Starters on Oct. 8

Colonel Archie Miller commander of the Long Island Fields announced at 4:18 p. m. that no more machines would leave Roosevelt Field that day.

The machines starting from Mineola, their time and order of departure follow. The figures are unofficial, but are the most reliable to obtain at this time.

No.	Pilot	Type Plane	Left Mineola A. M.
17	Lt. J. B. Machle	DeHaviland 4	9:10
11	Lt. Col. H. E. Hartney	Fokker	9:13
15	Lt. L. S. Webster	DeHaviland 4	9:13:56
29	Maj. Harry Smith	DeHaviland 4	9:14:35
37	Lt. H. D. Norris	DeHaviland 4	9:15:07
47	Capt. H. C. Drayton	DeHaviland 4	9:16:31
35	Lt. G. C. McDonald	DeHaviland 4	9:17:30
23	Lt. Col. T. S. Bowen	DeHaviland 4B	9:19:05
27	Maj. H. J. Miller	DeHaviland 4	9:21:31
31	Lt. B. W. Maynard	DeHaviland 4	9:24:56
9	Air Commodore Charlton	Bristol	9:34:58
41	Lt. R. C. Kirkpatrick	DeHaviland 4	9:59:30
39	Lt. E. M. Manzelman	DeHaviland 4	9:59:45
25	Lt. J. C. Williams	DeHaviland 4	10:08
10	Lt. D. B. Gish	DeHaviland 4	10:34:23
105	Lt. R. L. Maughan	Spad	10:56
45	Lt. T. Hynes	DeHaviland 4	10:59:26
4	Col. G. C. Brant	DeHaviland 4	11:10:46
32	Lt. J. P. Roullat	DeHaviland 4	11:12:05
5	Lt. W. C. Foskett	Le Pere	11:23:16
101	Lt. W. R. Taylor	S. V. A.	11:25:58
35	Lt. G. C. McDonald (2d start)	DeHaviland 4	11:42:45
*88	U. S. Mail Plane	Not an entrant	11:56:36
108	Lt. M. C. Newman	DeHaviland 4	11:59:54
			P. M.
106	Lt. J. T. Johnson	S. E. 5	12:13:06
14	Lt. Col. J. N. Reynolds	DeHaviland 4	12:35:40
16	Lt. H. H. George	DeHaviland 4	12:29:16
6	Lt. F. C. Nelson	DeHaviland 4	12:39:04
102	Maj. A. H. Gilkeson	DeHaviland 4	12:40
22	Capt. F. Steinle	DeHaviland 4	12:46:06
38	Lt. S. W. Torney	DeHaviland 4	12:56:45

50	Capt. J. O. Donaldson	S. E. 5A	12:58
2	Col. C. C. Culver	Fokker	1:04:43
48	Lt. H. D. Smith	DeHaviland 4	1:05:06
8	Lt. Alex Pearson, Jr.	DeHaviland 4	1:11:30
30	Lt. C. L. Osborne	DeHaviland 4	1:16:14
19	Maj. J. W. Simons, Jr.	Martin	1:36:16
24	Maj. A. L. Sneed	Le Pere	1:28:27
18	Capt. Roy N. Francis	Martin	1:35:53
42	Lt. J. B. Wright	DeHaviland 4	1:37:02
46	Lt. G. H. Gale	DeHaviland 4	1:39:28
34	Lt. A. M. Roberts	DeHaviland 4	1:40
36	Lt. L.V. Beau, Jr.	DeHaviland 4	1:40:15
44	Lt. French Kirby	DeHaviland 4	1:41:24
40	Lt. M. W. Sheridan	DeHaviland 4	1:49:15
20	Capt. J. J. Marquette	DeHaviland 4	1:55:57
28	Maj. E. D. Lyon	DeHaviland 4	2:28:56
7	Maj. H. Abbey	DeHaviland 4	3:57

STARTERS ON OCTOBER 9th

			A. M.
33	Lt. N. H. Langley	DeHaviland 4	9:31
			P. M.
	†Lt. D. B. Gish	DeHaviland 4	1:12

* Mistaken for a starter and timed.
† Re-entrant.

The First Day's Flight

At the end of the first day's flight these fliers were:

AT CHICAGO

Plane No. 31, Pilot Lieut. B. W. Maynard. Arrived at 5:33 P. M.

AT BRYAN, OHIO

Plane No. 15 Pilot Lieut. L. S. Webster. Arrived 6:33 P. M.

Plane No. 27 Pilot Major H. J. Miller. Arrived 5:24 P. M.

Plane No. 47 Pilot Capt. Harry Drayton. Arrived 6:27 P. M.

AT CLEVELAND

Plane No. 11, Pilot Lieut.-Col. H. E. Hartney. Arrived 4:21 P. M.

Plane No. 23, Pilot Lieut.-Col. T. S. Bowen. Arrived 4:08 P. M.

Plane No. 29, Pilot Major H. Smith. Arrived 4:49 P. M.

Plane No. 39 Pilot Lieut. E. M. Manzelman. Arrived 5:08 P. M.

AT BUFFALO

Plane No. 5 Pilot Lieut. W. C. F. Brown.
Plane No. 8, Pilot Lieut. A. Pearson, Jr.
Plane No. 14 Pilot Lieut.-Col. D. L. Reynolds.
Plane No. 16, Pilot Lieut. H. H. George.
Plane No. 17, Pilot Lieut. J. B. Machle
Plane No. 19 Pilot Major J. W. Simons, Jr.
Plane No. 22 Pilot Capt. F. Steinle.
Plane No. 32, Pilot Lieut. J. P. Roullot.
Plane 34, Pilot A. M. Roberts.
Plane No. 37 Pilot H. D. Norris.
Plane No. 38 Pilot Lieut. S. W. Torney.
Plane No. 45, Pilot Lieut. T. Hayes.
Plane No 50 Pilot Capt. J. Donaldson.
Plane No. 102, Pilot Major A. Gilkeson.
Plane No. 108, Pilot Lieut. G. Newman U. S. M. C.
Plane No. 42, Pilot Lieut. J. B. Wright.
Plane No. 40, Pilot H. V. Sheridan

AT ROCHESTER

Plane No. 6, Pilot Lieut. F. C. Nelson.
Plane No. 18, Pilot Capt. R. N. Francis.
Plane No. 28, Pilot Major F. B. Lyon.
Plane No. 36 Pilot Lieut. L. V. Beau, Jr.
Plane No. 44, Pilot Lieut. F. Kirby.
Plane No. 48 Pilot Lieut. H. D. Smith

Second Day's Flight

Following are the points reached on the second day by the aviators who started from Mineola in the transcontinental flight, with the distances from New York:

CHEYENNE, 1,696

Lieut. B. W. Maynard, DH-4, No. 31.

DES MOINES, 1,123

Capt. H. C. Drayton, DH-4, No. 47.

ROCK ISLAND, 965

Major Henry J. Miller, DH-4, No. 27.

CHICAGO, 810

Lieut. L. S. Webster DH-4, No. 15 (left for Rock Island.)
Lieut. Alex. Pearson, Jr., DH-4 No. 8.
Major Harry Smith, DH-4, No. 39.
Capt. J. O. Donaldson, SE-5 No. 50.

CLEVELAND, 503

Lieut W. C. F. Brown, DH-4, No. 5.
Lieut.-Col. J. N. Reynolds, DH-4, No. 14
Lieut.-Col. T. S. Bowen, DH-4B, No. 23.
Lieut. J. P. Roullot, DH-4, No. 32.
Lieut. T. Hynes, DH-4, No. 45.
Lieut.-Col. H. Hartney, SE-5, No. 11
Lieut. G. Newman U.S.M.C., DH-4, No. 108.

Lieut. Belvin Womble Maynard

BUFFALO, 323

Lieut. F. C. Nelson, DH-4, No. 6.
Lieut. H. W. Sheridan, DH-4, No. 40.
Lieut. H. H. George DH-4, No. 16.
Lieut. J. B. Machle, DH-4. No. 17.
Major J. W. Simons, Jr., DH-4, No. 19.
Capt. F. Steinle, DH-4, No. 22.
Lieut. J. B. Wright, DH-4, No. 42
Major E. B. Lyon, DH-4, No. 28.
Capt. R. N. Francis, Martin, No. 18.
Major A. H. Gilkeson, DH-4 No 102.

AT ROCHESTER, 267

Lieut. C. C. Osbourne, DH-4, No. 30.
Lieut. H. Abbey DH-4 No. 7.
Lieut. L. V. Beau, Jr., DH-4, No. 36.
Lieut. S. W. Torney DH-4 No. 38.

AT MINEOLA

Lieut. R. Kirkpatrick, DH-4, No. 41.

OUT OF THE RACE

Col. C. C. Culver Fokker, No. 2, crashed between Rochester and Buffalo.

Capt. J. J. Marquette DH-4, No. 20, crashed at Waverly N. Y.

Lieut. H. N. Langley, DH-4, No. 33, crashed at Hudsondale Pa.

Lieut. A. M Roberts DH-4, No. 34, dropped into Lake Erie.

Lieut. H. D. Smith DH-4, No. 48, crashed at Lockport N. Y.

Lieut. B. Haynes Nieuport, No 107, crashed at Mineola.

Western Starters

Lieutenant J. P. Richter piloting a De Haviland airplane, with Lieutenant J. B. Patrick as observer, leaving the ground at 6:51 A. M. on Oct. 8 was first of the fifteen Western aviators to "hop off" in the 2,700-mile race to Mineola L. I. Cadet D. A. Cardiff, second to take the air, left at 6:52. His plane carried no observer. The first six machines rose in less than five minutes and they were closely followed by three more.

A high fog hung over the aviation grounds at about 1,000 feet altitude. The fliers said they would get out of the fog at 3,000 feet. Getaway conditions otherwise were perfect.

The sixteenth and last entry a Fokker plane, piloted by Lieutenant F. W. Siefert, had not arrived from San Diego in time for the start.

Program for the Westerners

The position of the San Francisco starters at the end of the second day was as follows, with the distance in miles from the Pacific path:

OMAHA, 1460

Capt. L. H. Smith, H-4 B, No. 58.

ST. PAUL, NEB., 1,328

Major Carl Spatz, DH-4B No. 61.
Lieut. E. C. Kiel DH-4, No. 62.

NORTH PLATTE, NEB., 1,210

Lieut. D. Worthington SE-5, No. 60.

SALT LAKE, 618

Major. J. C. Bartholf, SE-5, No. 51.
Lieut. J. G. Hall DH-4, No. 6.
Lieut. P. Richter, DH-4, No. 65.

OUT OF RACE

Lieut. R. Kauch, DH-4, No. 59, down at Coalville, Utah.

Lieut. E. V. Wales DH-4, No. 63, crashed at Obert Pass.

MISSING

Lieut. S. Hall, DH-4B, No. 25, between Salt Lake and Rawlins.

Lieut. H. E. Queen, DH-4, No. 52, between Salt Lake and Rawlins.

Colonel Dodd Killed

Col. Townsend F. Dodd, commander of Langley Flying Field, Va., was killed Oct. 5, at Bustleton, near Philadelphia, when the De Haviland airplane he was flying to Mineola to start in the army coast-to-coast race crashed as he was leaving the field. His machanic was slighly injured.

Col. Dodd was one of the first American officers to become a commissioned aviator. He was a native of Illinois and was graduated from the University of Illinois in 1907

Col. Dodd was transferred from the Coast Artillery to the Signal Corps and was commissioned a colonel when the Army Air Service was made a separate branch of the army

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Telephone, Stuyvesant 4552

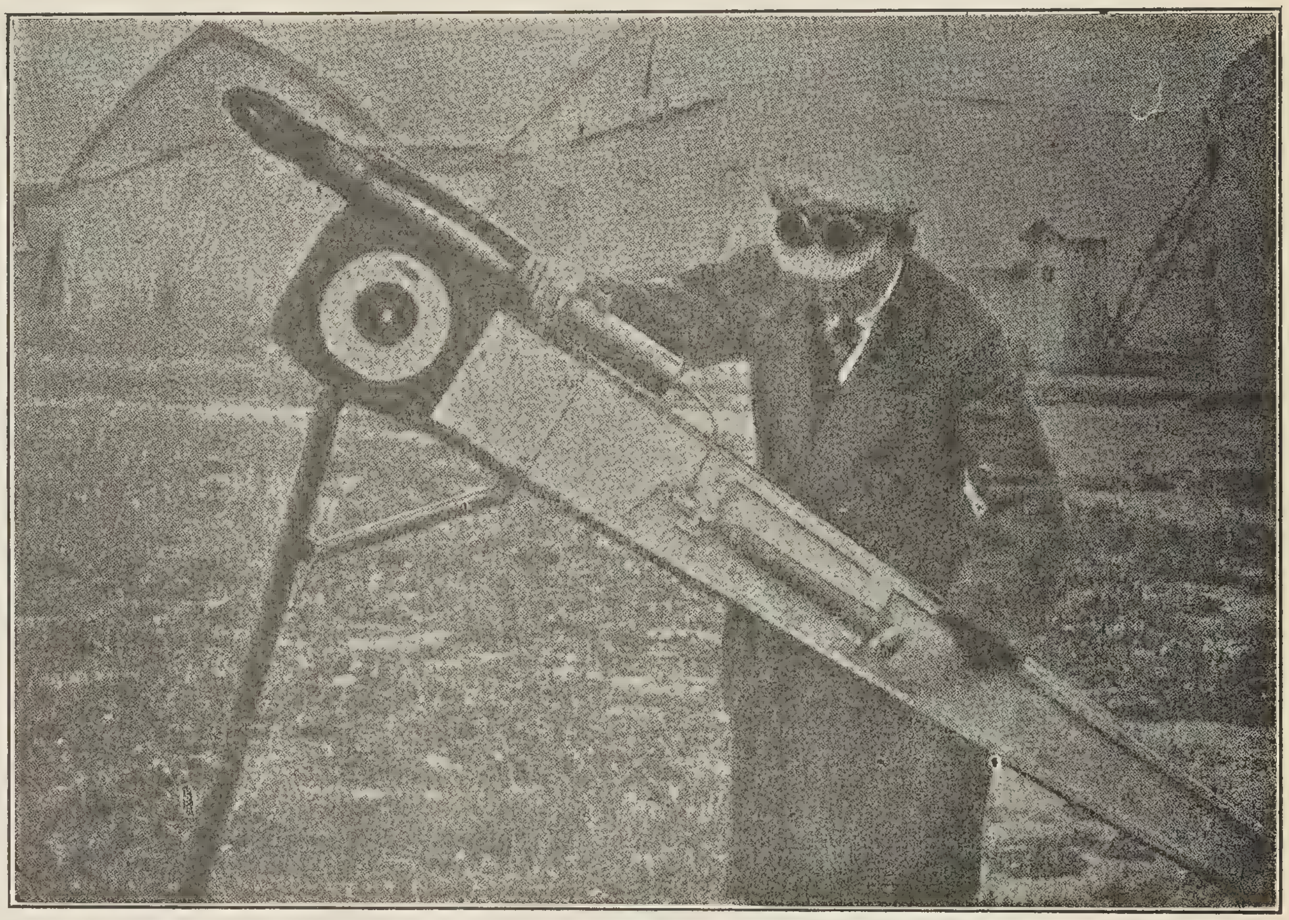
Notes on Technical Aeronautics

New "Prop Swinger"

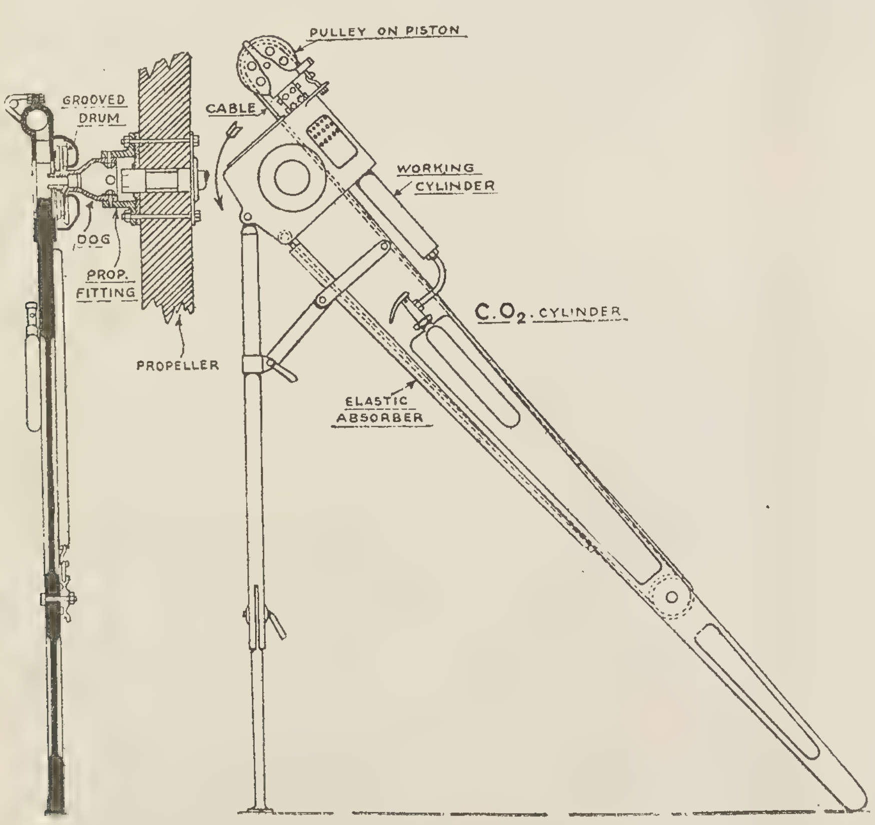
A very interesting "prop swinger" has just been brought out by a French firm, the Borel Establishment of Paris.

The Odier starter, which is shown in the accompanying illustrations, consists of a "biped," carrying at its upper end a long steel cylinder and piston. Attached to the extremity of the piston, which projects outside the cylinder, is a pulley over which a cable is passed, having one end fastened to the cylinder, and the other end wound four times round a grooved drum, and then secured to an elastic absorber. The grooved drum is mounted on a short shaft having a bell-shaped extremity on which four projections are placed symmetrically around the periphery in such a way that they can be made to engage with sloping recesses in a standard fitting mounted on the boss of the propeller or tractor screw.

Mounted on the apparatus is a small tube or reservoir, containing liquid carbonic acid and connected up to the cylinder. The operation of starting-up is as follows: The apparatus—which can be adjusted in height by means of the telescopic leg shown—is held so that, with the legs resting on the ground, the driving dog is brought into contact with the fitting on the air screw. On pressing a small lever, pressure from the CO_2 reservoir forces the piston outwards, thereby tightening the cable around the drum and causing the latter to make two sharp revolutions. The air screw is thus also rotated and the engine started, and through the angle given the recesses in the air screw fitting, the starter is pushed forward and disengaged. Should the engine backfire, neither the apparatus nor the operator is in any way injured, for as soon as the drum rotates in the opposite direction, it brings the piston back, against the already expanded gas, when the cable becomes slack, leaving the drum free to rotate indefinitely.



The Odier Portable Engine Starter

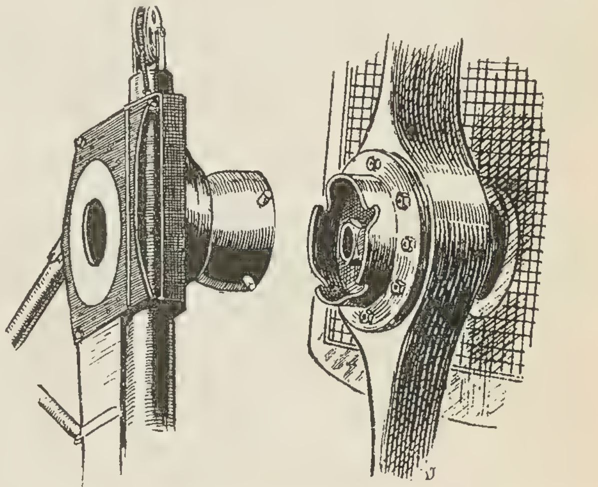


General View of the Odier Portable Engine Starter

The carbonic acid flasks are similar to those used for fire-extinguishers, flame-projectors, "Sparklets," etc., each flash being capable of giving five starts with a 300 horse-power Hispano-Suiza engine. Larger flasks are also supplied.

Hundreds of these starters have been used on all types of engines, such as the 130 horse-power Clerget, 200 and 300 horse-power Hispano-Suiza, 400 horse-power Liberty, 350 horse-power Napier, Rolls-Royce, etc.

That this starter is easy and speedy in operation is proved by the fact that at a certain aerodrome an apprentice, 15 years old, started six machines in seven minutes. On another occasion a 400 horse-power twin-engined Borel-Odier postal seaplane had to make seven forced descents upon the water owing to a leak in the radiator. As it was very rough, starting by hand would have been out of the question, but fitted with the stationary type Odier starter—which is bolted on the crank-end, with operating controls situated inside the cockpit—fourteen successful starts were easily accomplished.



Showing the Driving Coupling of the Odier Starter

Airplanes In Alaska

The Alaska Aircraft Transportation Co. of Seattle, Wash., and Naldez, Alaska, during the closed season of Bering sea and Alaskan navigable rivers, intends to operate airplanes service from Valdez for carrying freight for quick delivery to all important points in Alaska. At other times places will be used from the rail or steamer terminals to the nearest suitable landing field to the ultimate consignee port. More than fifty places already are on the company's map.

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ALEXANDER KLEMIN. *Aeronautic Editor*
LADISLAS D'ORCY. . . *Aerostatic Editor*
GEORGE NEWBOLD. . *Business Manager*

Flying Proof Necessary

WHO owns the air? Without entering into a controversy as to whether the holder of a deed to a plot of ground also exercises control "as high as heaven and as deep as hell," it may be stated as a principle—already accepted by the leadng European nations—that a country has complete sovereignty of the air above its land and water dominions. This principle is adopted as a precaution necessary to self defense, but it is qualfied, in time of peace, by agreements providing for the passage of commercial aircraft, subject to such regulations as may be deemed rightful.

Starting thus with national control and international contact in the matter of customs, it is logical to assume that it is the duty of the Federal government to lay down fundamental rules and practices by which all concerned may be guided, whether builders, owners or operators of aircraft, keepers of airdromes or landing fields or state or municipal legislative bodies seeking to supplement national regulation in purely local matters.

Thus the day is at hand when manufacturers of aircraft, whether airplanes, hydroairplanes, flying boats or balloons, look to the Federal government for advice and counsel regarding materials used in construction. The day will soon come when the Federal government will have to adopt a system of aircraft inspection comparable, possibly, to the practices now followed in dealing with water craft. Knowing the standard dependability of materials and the inherent strength of a flying machine by rigid sand loading tests—such as were imposed during the war—the Federal government in addition should require satisfactory flying proof before issuing a certificate of airworthiness.

Behind the issuance of such a certificate lies coordination which is vital to safe aerial navigation. Army and navy authorities should cooperate with officials having to do with civilian flying so that maximum results can be achieved.

Air Forces Recognized

HOW the Peace conference regarded the air service is disclosed in Article I. of the Peace Treaty which speaks of "Military, Naval and Air Forces and Armaments." The significance of special designation officially accorded to the air forces emphasizes the contention of those persons who favor an independent air service that the service naturally is and should be separate from both the army and navy.

Tapered Struts

IT has long been customary to use tapered struts in airplane construction. Sometimes the strut is tapered down gently from its center portion; sometimes it consists of a parallel center portion with ends of conical taper, which from a production point of view is far superior to the former type, although slightly less advantageous from a weight and aerodynamic point of view.

In both cases the designer has generally beeen guided by eye alone. He has as a rule subjected the struts to test, found them amply strong and passed on to other duties.

But although the strut with a center parallel portion, and ends of conical taper usually has been made quite strong enough, this does not mean to say that full advantage has been taken of this refinement.

A recent paper before the Aeronautical Society gives some useful warnings on this score. A complicated but extremely able matehmatical analysis demonstrates that while struts of conical taper if correctly designed are only 1% heavier, and have, if exposed to the air, less than 1% more wind resistance than ideal struts tapered from the very center. Their adoption therefore, is quite legitimate, since simplicity of manufacture may well place as superior to the ideal strut. But faulty design may lead to a very inefficient strut, and easily to a strut that is actually heavier than a simple parallel strut of the same strength, so that a bad taper may be worse than useless.

This is the negative warning. On the other hand the same paper points out that the conical tapered strut may be made 12% lighter than a simple parallel strut of the same length and strength.

The paper and its result and formula for correct dimensioning seem well worthy of study.

Ground School Aerodynamics

THERE is no doubt, of course, that the ground schools were a most valuable part of our war efforts, and that fliers could never have been trained so thoroughly and so systematically without their establishment.

But if the ground schools popularize aerodynamics, they also seem to have sown in the minds of many of their alumni some peculiarly unorthodox ideas. Catch a ground school man unawares and ask him if lift is always vertical. He will certainly say, yes. The correct definiton that lift is perpendicular to the direction of motion has never been given him properly. He speaks of center of thrust with blind confidence. A high center of gravity is absolutely fatal, so he was told at ground school. It would seem as if one result of the ground schools was the sowing of a good many misconceptions which may prove hard to eradicate.

Surplus Material

THE great problem of the Air Service in the immediate future will be the utilization and disposal of surplus material. At various cities are large quantitie of supplies which will have to be used, stored or disposed of. Completed planes, motors and accessories can be handled without great difficulty but parts that will never be assembled are the supplies that will require the most careful disposition. To junk these will be to practically throw them away. To continue to store them will serve no useful purpose and only add to the expense of the Air Service. The sooner a practical disposal plan is presented and put into effect, the quicker will the danger of ultimate criticism be avoided.

Utilizing a Valuable Asset

THIS nation has a most valuable asset in the literally thousands of trained pilots and air mechanics that peace has liberated from active service with the colors. What greater benefit could be done for our country than to devise the means by which this magnificent body of men might find remunerative employment at the present time, and, with increasing knowledge of their art, be available to be called again to active duty during a national emergency.

THE WORLD'S AIRPLANES AND SEAPLANES
Curtiss Three-Seater Oriole

Curtiss Three-Seater

Here are the specifications of the Curtiss Three-Seater Passenger Sporting Model Oriole; motor model—Curtiss six:

GENERAL DIMENSIONS

Length of machine overall	25 ft. 0 in.
Width of machine overall	36 ft. 0 in.
Height of machine overall	9 ft. 5 in.
Wing span	36 ft. 0 in.
Wing chord	5 ft. 0 in.
Maximum panel length	16 ft. 7 in.
Length of fuselage	23 ft. 3 in.
Width of fuselage	3 ft. 2 in.
Height of fuselage	3 ft. 8 in.
Height of tail	4 ft. 3 in.
Width of tail	10 ft. 1½ in.
Landing chassis—diameter of wheels	26 in.
Landing chassis—tread	$63^{11}/_{16}$ in.

MOTOR

Model Curtis "Six," 6 cylinder, "en bloc" four-stroke cycle	Water cooled
Horse power (rated) at 1700 r.p.m.	150
Weight per rated horse power	2.78 lbs.
Bore and stroke	4½ in. x 6 in
Fuel consumption per hr	13.3 gals.
Fuel tank capacity	45.5 gals.
Oil capacity provided—crankcase	5 gals.
Fuel consumption per brake hp. per hr.	0.55 lb.
Oil consumption per brake hp. per hr.	0.030 lb.

PROPELLER

Material	Wood
Pitch—according to requirements of performance.	
Diameter—according to requirements of performance.	
Direction of rotation (viewed in slip-stream)	Clockwise

WEIGHTS

Total weight (full load)		2354 lbs.
Net weight (including water)		1564 lbs.
Useful load		790 lbs.
Fuel, 45.5 gallons	273 lbs.	
Oil, 5 gallons	37 lbs.	
Pilot	160 lbs.	
Passengers, or other load	320 lbs.	
Total	790 lbs.	
Fuselage (with motor)		1063 lbs.

DETAILS

One gasoline tank located in fuselage, one gravity tank in upper panel.

Pilot seat and controls in rear cockpit; two passengers and one set of controls in front cockpit.

Tail skid independent.

Standard equipment—tachometer, oil gauge, gasoline gauge, air speed meter, clock, electric starter, aneroid barometer, complete set of tools.

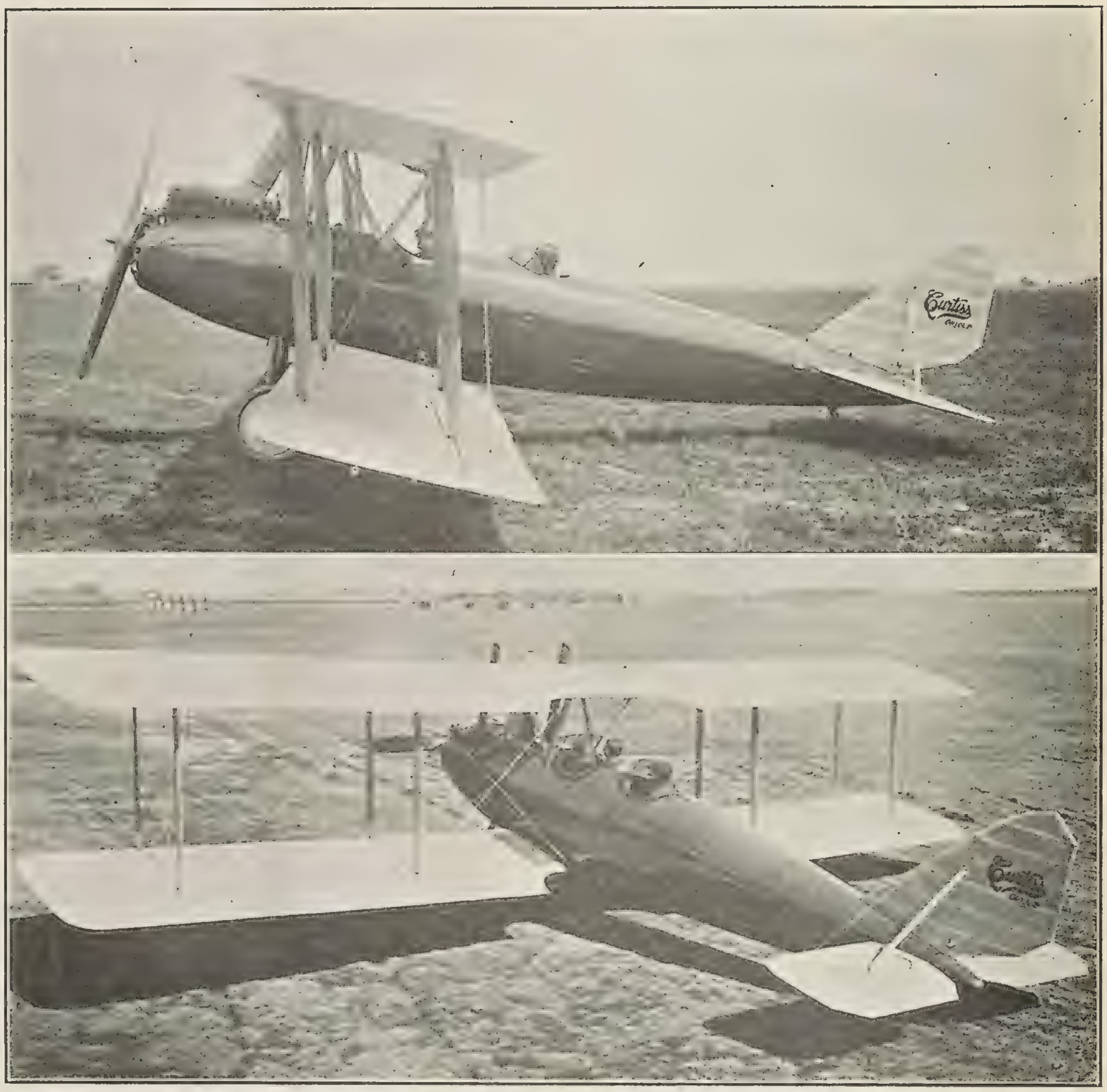
Other equipment on special order.

PERFORMANCE

Condition.	Sea Level (observed.)
Maximum speed	96 m.p.h.
Minimum speed	49 m.p.h.
Economical speed	60 m.p.h.
Maximum ceiling (approx.)	15,200 ft.

MAXIMUM RANGE

Endurance at high speed (miles) at sea level.	290 miles
Endurance at high speed (hours) at sea level.	3.0 hours
Endurance of economical speed (miles) at sea level	440 miles
Endurance at economical speed (hours) at sea level	7.3 hours


Two views of the Curtiss Three-Seater Passenger Sporting Model Oriole; Motor Model Curtiss Six

Exposition in Chicago

The enterprising city of Chicago will have the first national aeronautical exposition in 1920. It will be held in the Coliseum during the week of January 8, immediately preceding the automobile show and will be the most pretentious aeronautical exhibition ever attempted indoors.

All details of the exposition will be handled by an executive committee of Chicagoans, headed by George W. Browne, prominent in the automobile and aeronautical worlds. The other members of the committee are John Burke of the Congress Hotel, A. C. Barber, District Manager of the Overland Automobile Company; Stewart Spalding of the Coliseum Company, and C. Y. Kenworthy. The secretary will be Walter Hempel.

The exposition is held under the sanction and with the support of the Manufacturers' Aircraft Association which, at its next meeting, will appoint a committee to co-operate in making the show a success.

Mr. Browne and his associates have planned for a year to give Chicago a real aeronautical exposition. The project finally created enthusiasm among the various manufacturers and correspondence on the subject of space shows that all the prominent makers of aircraft will be represented at the exposition with the very latest types of machines. There will be a large display of accessories also.

"There will be great activity in aeronautics in 1920 throughout America," said Mr. Browne recently, "and it will mean much to Chicago to start the ball rolling with a big show. This city is logically the aeronautical capital of the nation but if we are to take our proper place we must show some initiative. The exposition which will be held here in January will center the attention of the entire aviation world on Chicago."

Headquarters for the preliminary work on the exposition have been established in Suite A 6, Congress Hotel with Mr. Hempel in charge.

As the show will be given in its entirety in one building, accessory space is limited. The price of exhibition space in the accessory section is $1.50 per square foot. Contracts and floor plans will be available shortly. Location of space will be assigned in the order in which applications are received and applicants advised of the order of choice of location of space, by return mail.

SIGHTSEEING SERVICE

W. T. Atkinson an ex-army aviator, has organized an aerial sightseeing service over the city of San Antonio Texas. A fifteen mile flight from Stinson Field over San Antonio, the old Spanish Missions, San Jose and Conception and back to Stinson Field will be regularly made for passengers every week day and Sunday.

A limited number of students will also be given flying instructions.

W. T. Atkinson was an instructor in the Air Service for a year, being stationed at Carlstrom Field, Arcadia, Fla., Brooks, Field, San Antonio, Texas, Rich Field, Waco, Texas, and Love Field, Dallas, Texas and has taught a large number of aviators to fly.

View from the air of the Aeromarine Plane and Motor Co. Plant at Keyport, N. J.

Goodyear II Victor

In the first national balloon race held in this country since the war, open to all American pilots, the balloon Goodyear II, piloted by Ralph Upson, chief aero engineer for The Goodyear Tire & Rubber Company of Akron, O., with Ward T. Van Orman acting as aide, has just won the American championship.

The race was started from St. Louis with ten balloons competing, piloted by well known American balloonists, a number of whom had competed in former national contests. The ten big bags, all of 80,000 cubic feet gas capacity, were spread out on the field early in the morning and inflation begun, illuminating gas being used.

Promptly at 6 P. M. the first balloon was sent up, the others following at intervals of five minutes.

The course of the winning balloon, Goodyear II, took it over Lake Michigan, Lake Huron, Georgian Bay, across Ontario and the northern part of Lake Champlain, finally landing at Dunham, Quebec, a few miles north of the Vermont State line, having covered an air distance of 1050 miles.

Upson's triumph over his nine competitors brings victory for the third time to Goodyear in the National race. Upson having won the 1913 event and R. A. D. Preston the 1914 race. Both are eligible to enter the International balloon race to be held in the Unite States in 1920. Both of these pilots prove to the world the supremacy of America pilots in the last International race held a Paris, France, in 1913, when in a wonderfu flight from Paris to northern Scotland, the won the International championship in th American balloon, Goodyear, over a larg field of crack balloonists from all parts o Europe.

H. E. Honeywell finished second with a distance record of 920 miles, while E. S. Col was third, having flown 860 miles.

The balloon Wichita was wrecked o Lake Huron, and the bodies of Lieut. Edwar J. Verhadey and Capt. Carl W. Dammann both of St. Louis, were recovered severa days later. Among the other pilots in th race were: Capt. Elmer G. Marschuetz, E S. Cole, J. S. McKibben, G. L. Bumbaugh, H E. Honeywell, Warren Rasor, Wm. Assma and P. M. McCullough.

An Indian Takes to Air

Mike Campbell, a wealthy Spokane Indian, is likely to be an early owner of a pleasure airplane. After one trip aloft Campbell announced his determination of mastering the air. And he had the ready cash on him at the moment to buy a machine had there been one for sale. The Indians of the district have gone in extensively for motoring, invariably purchasing costly machines. From motoring to aviation is an easy step, and Campbell is more than likely to astonish his tribe some fine day by landing in the middle of the reservation from a flying machine.

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The Army Air Service Pilot's Schools will open at Carlstrom Field, Arcadia, Fla., and March Field, Riverside, Cal.

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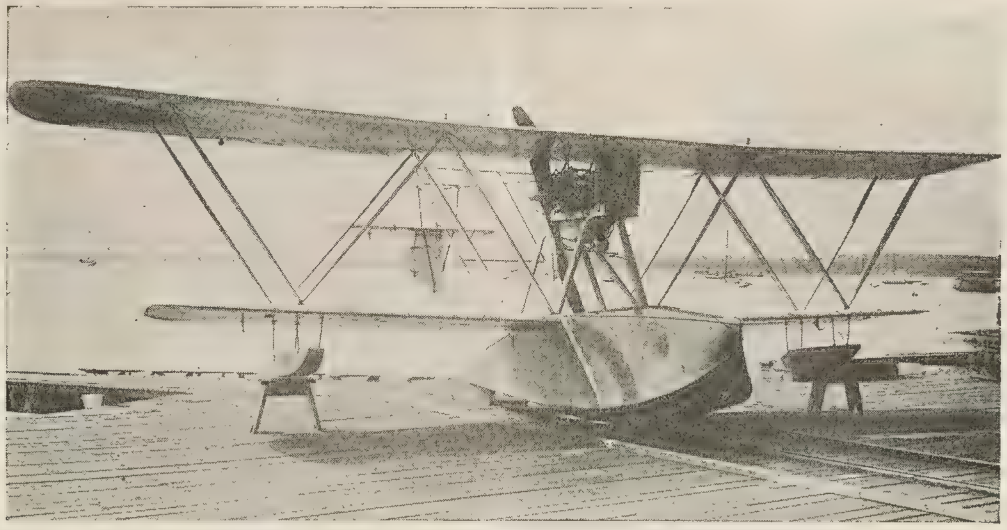

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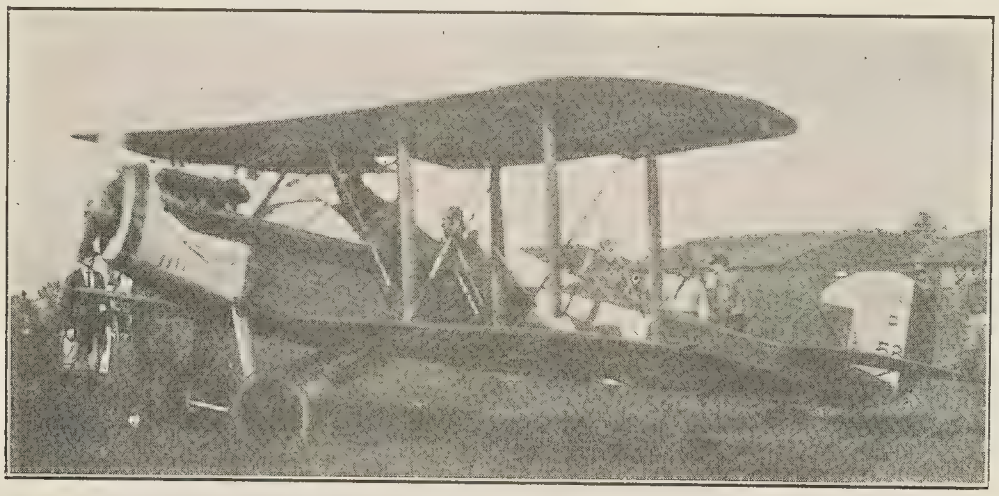

¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

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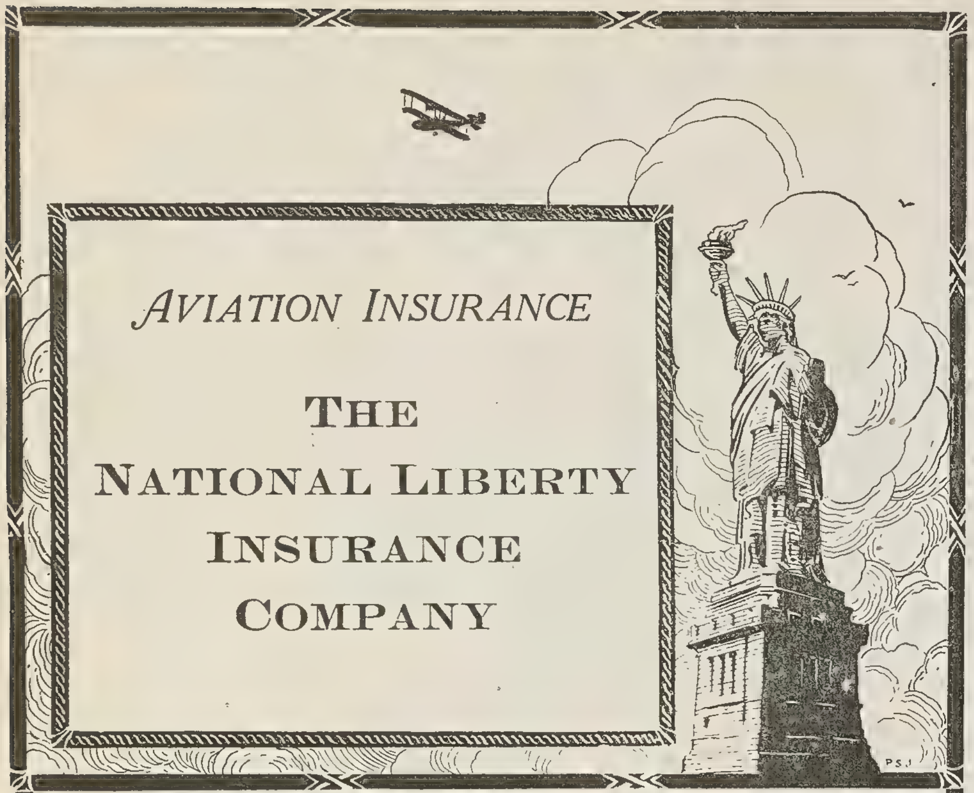

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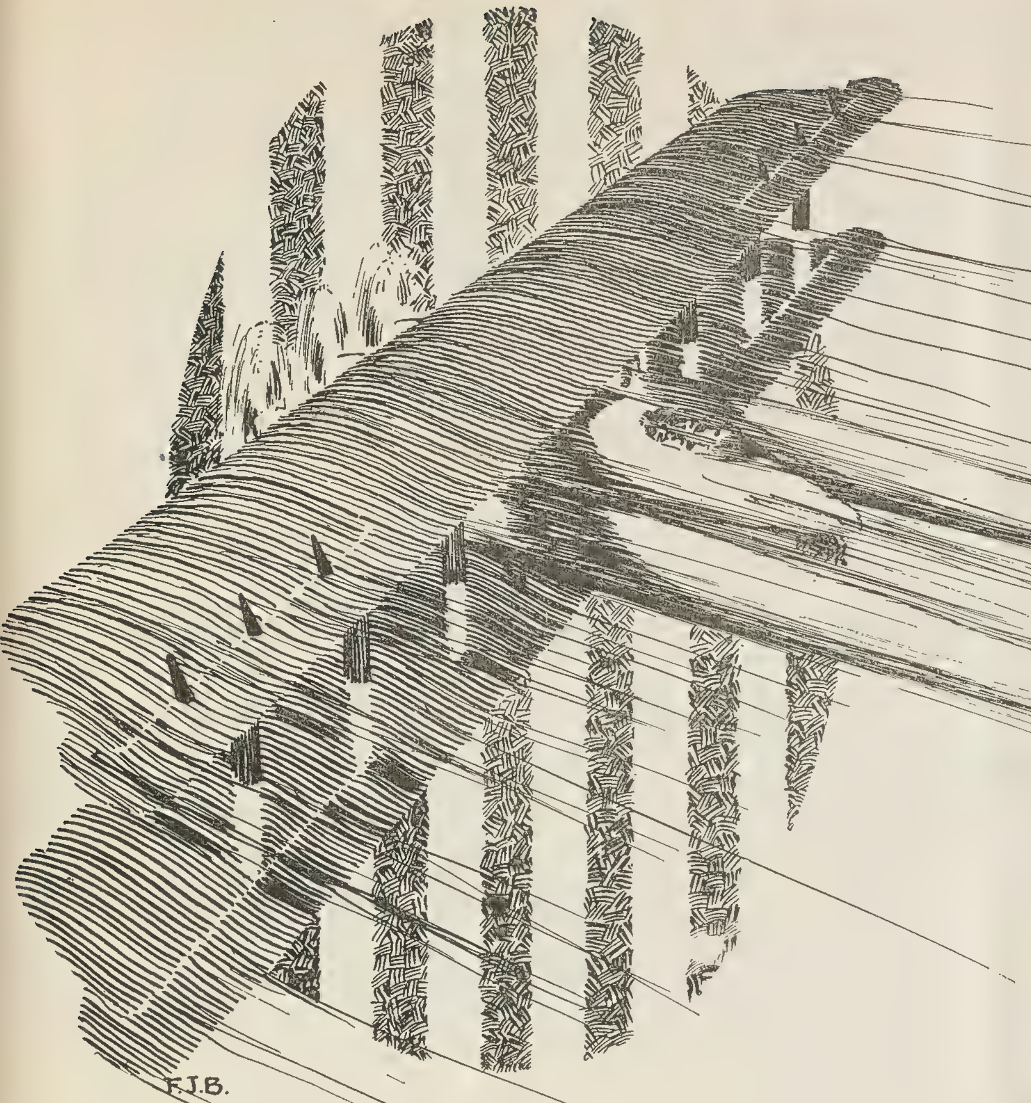

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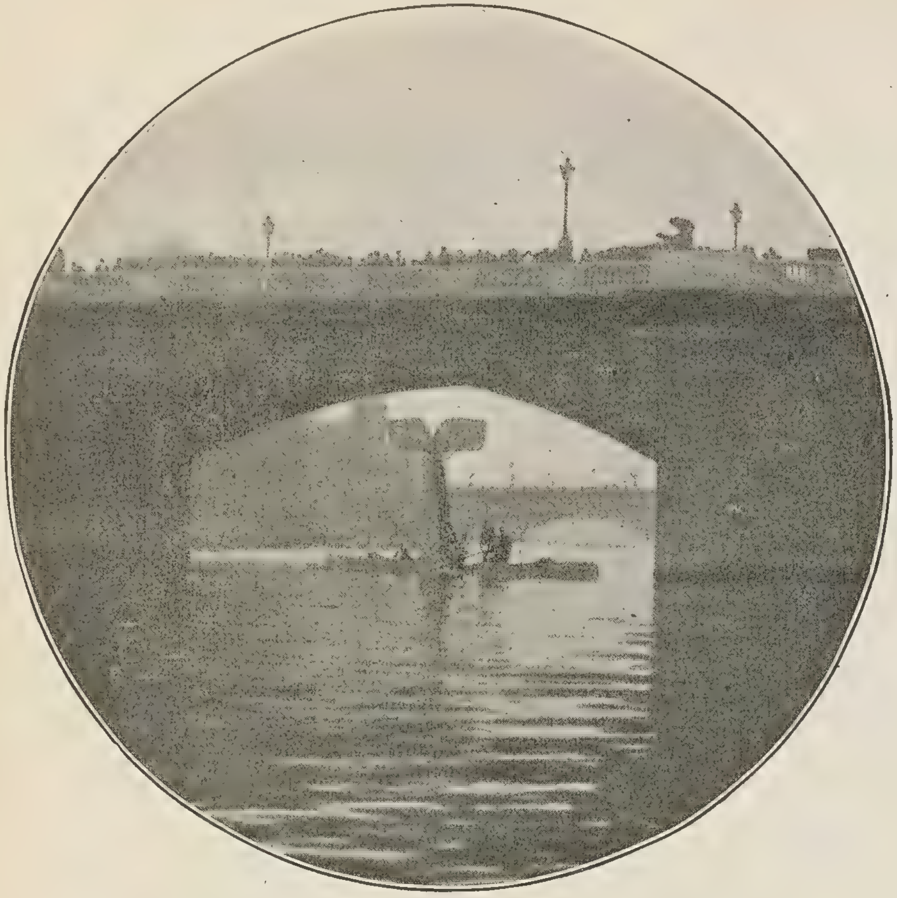

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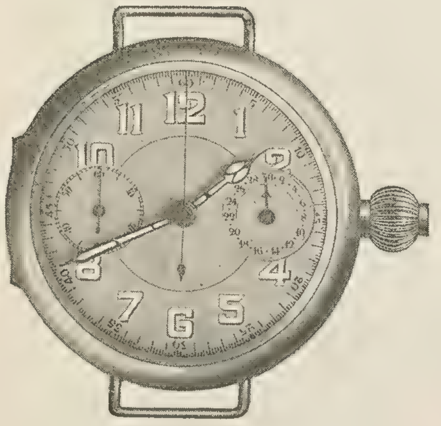

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While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

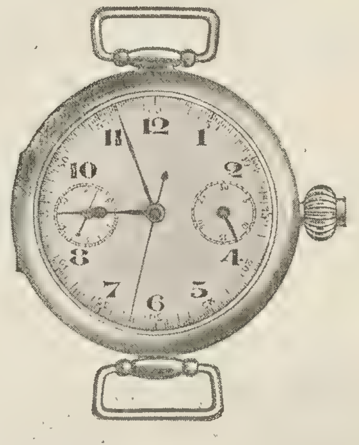
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations, for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS



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New Radiator Cap

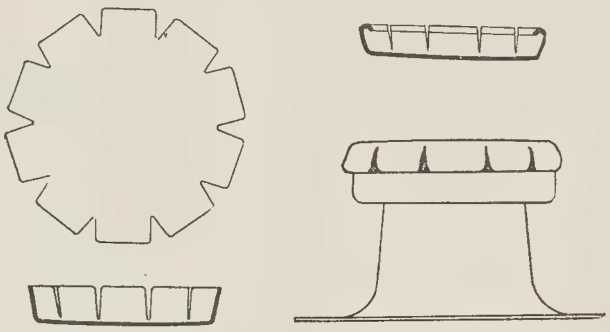
Those who have seen the remarkable Vought VE-10 flying-boat have had their attention especially drawn to its many excellent design and construction details, one of which is its very unique rediator cap. This cap is an intelligent departure from any cap design that has yet been used and appears ideal for use in aircraft construction. It is extremely light, weighing less than one-half of an ounce. This is equivalent to saying that it is but one-sixteenth, or less, the weight of the ordinary cap. Besides low weight it has the aerodynamic advantage of low head resistance. It has no square corners or other eddy-making features. It is cylindrical in shape and relatively small for its utility.

In addition to the foregoing advantages it is extremely simple in design. It has no cut threads or other machine finishing that can be injured or damaged by improper treatment. It is a simple sheet metal stamping. The cap is removed from the filler base by pressing the center of its top which springs the rim outward. Since the edges are flanged and serrated the cap releases its hold and may be lifted off. There is no possibility of it ever having to be forced. It is fastened to the filler base by simply squeezing in the sides.

The cap is made by the U. S. Metal Cap and Steel Company, 107 West 13th Street, New York City, who manufacture it in different sizes for use on radiators, gas tanks, breather pipes, hulls, pontoons, etc. It is appropriately trade-marked "Upressit." U-Press-It in the center to remove and U-Press-It on the sides to close and lock in place.

The "Upressit" cap has a very neat appearance. It is ordinarily made of heavy tin plate but can be made of spring brass or cold rolled steel of various gauges. The cap is now manufactured in nine sizes, from 25½ m.m. or 1⅛ ins. in diameter up to 107 m.m. or 4¼ ins. in diameter.

The cap is made in three operations which are performed progressively in an automatic machine. The accompanying drawings illustrate the stages of manufacture and indicate the methods used. After the third operaton a rubber washer liner is inserted which makes the cap water tight.



New Radiator Cap

These caps are now made standard parts on the Vought airplanes, being used with standardized filler bases on radiator, fuel and oil tanks. The caps are interchangeable throughout.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

of Aircraft Journal, published weekly at New York, N. Y., for October 1, 1919.

State of New York,
County of New York. ss.:

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Herbert M. Williams, who, having been duly sworn according to law, deposes and says that he is the business manager of the Aircraft Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: The Gardner-Moffat Company, Inc., 22 East 17th St., New York.
Editor: Lester D. Gardner, 22 East 17th St., New York.
Managing Editor: George H. Dickinson, 22 East 17th St., New York.
Business Managers: Herbert M. Williams, George Newbold, 22 East 17th St., New York.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock).

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state). None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

HERBERT M. WILLIAMS,
Business Manager.

Sworn to and subscribed before me this 6th day of Oct., 1919.

FRANKLIN H. BROWN,
Notary Public, Kings County, No. 398.

Certificate filed in New York County.
(My commission expires March 30, 1921).

Proposals for Airplane Design and Construction.—Office of Contracting Officer, Eng. Div., A. S., McCook Field, Dayton, O.—Sealed proposals will be received here until 10 A.M., Oct. 15, 1919, and then opened, for furnishing certain types of experimental airplanes, designed and constructed by successful bidders. Further information on application.

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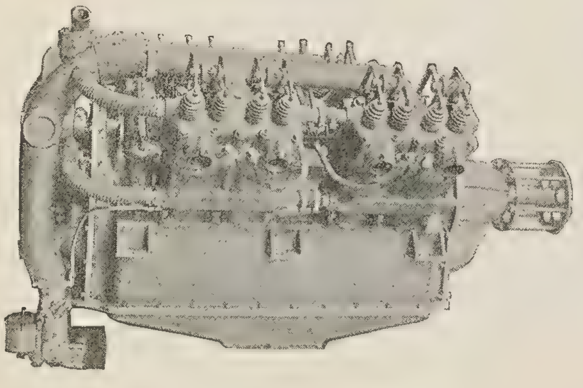

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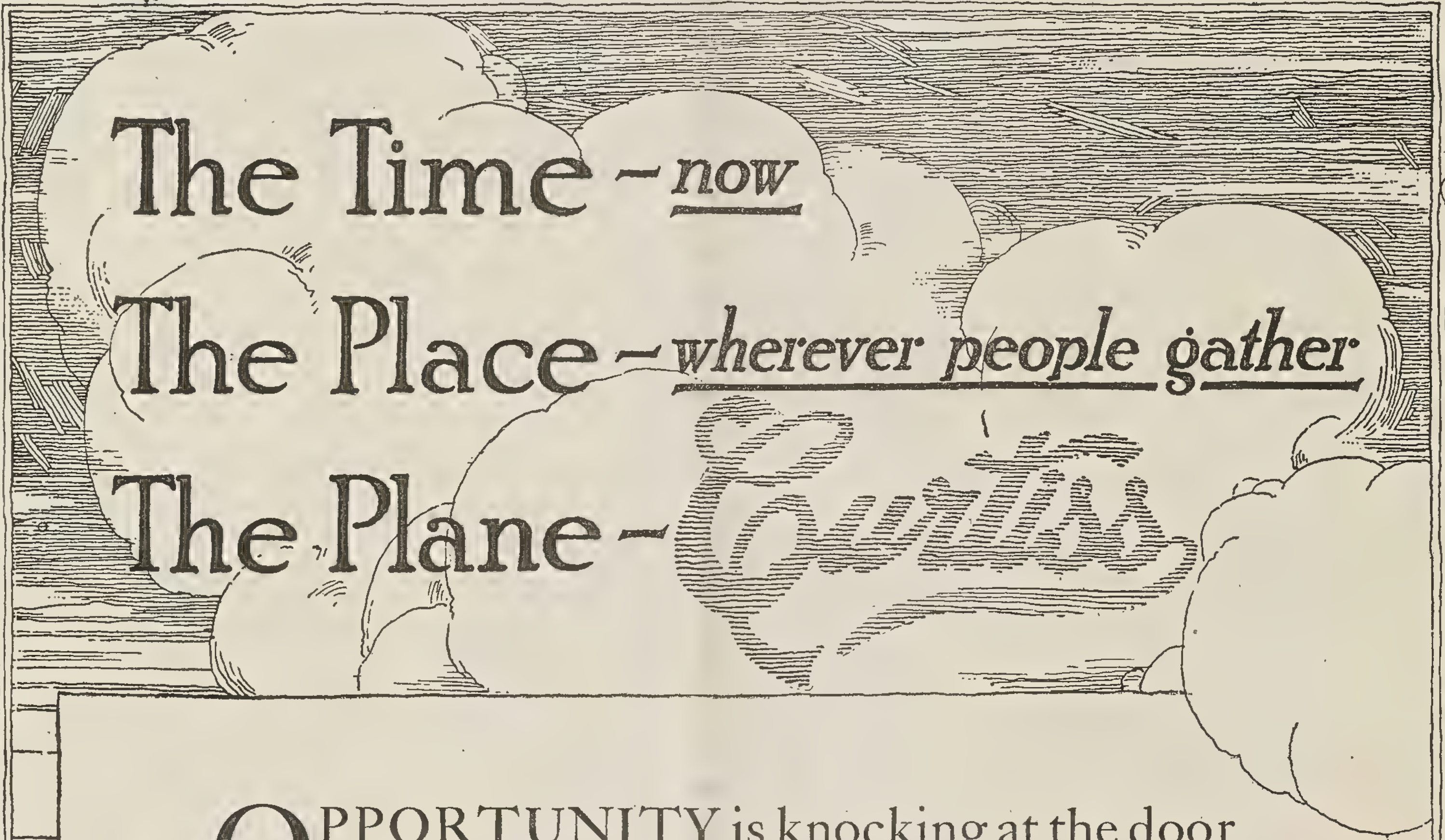
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October 18, 1919 Every Saturday Price Ten Cents

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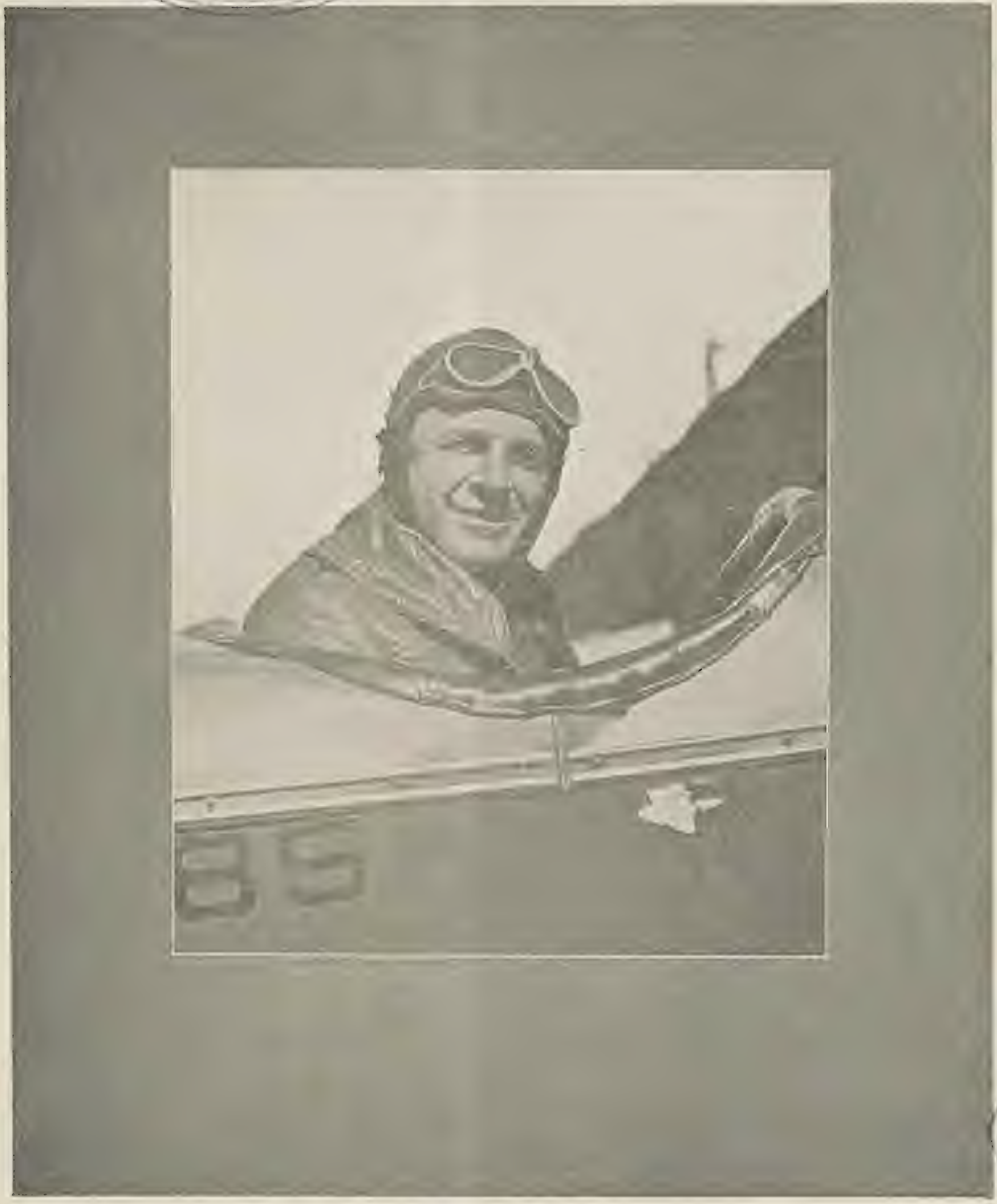

(C) Paul Thompson

Assistant Secretary of War Benedict Crowell, Taken Just Before the Start of the Transcontinental Air Race

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Owing to the General Strike of the New York Printers This Issue Was Printed in a Rural Newspaper Office

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

The Glenn L. Martin Company
CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

Transcontinental Reliability Test

Lieut. B. W. Maynard Led the Sixty-Two Contestants on East to West Leg

First Lieut. Belvin W. Maynard, pilot, accompanied by Sgt. W. E. Klein as passenger, in DH-4 No. 31, flying westward, was the first contestant in the Transcontinental Reliability Test to complete the journey across the continent; Second Lieut. E. C. Kiel, pilot, and Sgt. F. McKee, passenger, in DH-4 No. 62, flying eastward, was second; and Major Carl Spatz, pilot with Sgt. E. Tanner, passenger, in DH-4 Bluebird No. 61, flying eastward, finished third. It so happens that of these three, Lt. Maynard started last, Lt. Kiel next, and Major Spatz first.

The following figures have been determined from official telegraphic reports to the Director of Air Service from the control stops, and show the actual flying time and rate of miles per hour for each of the first three contestants to complete the trip of 2,701 miles, subject to correction upon review of pilots' and control commanders' log books:

	Actual Flying Time hrs.	min.	sec.	Rate of m. p. h.
Lt. Maynard	25	11	8½	107.45
Lt. Kiel	28	22	14 2-5	95.30
Major Spatz	28	56	47	93.54

There is a possibility that some other contestant who has been held a long tme in the eastern controls, may make faster actual flying time than Lieut. Maynard.

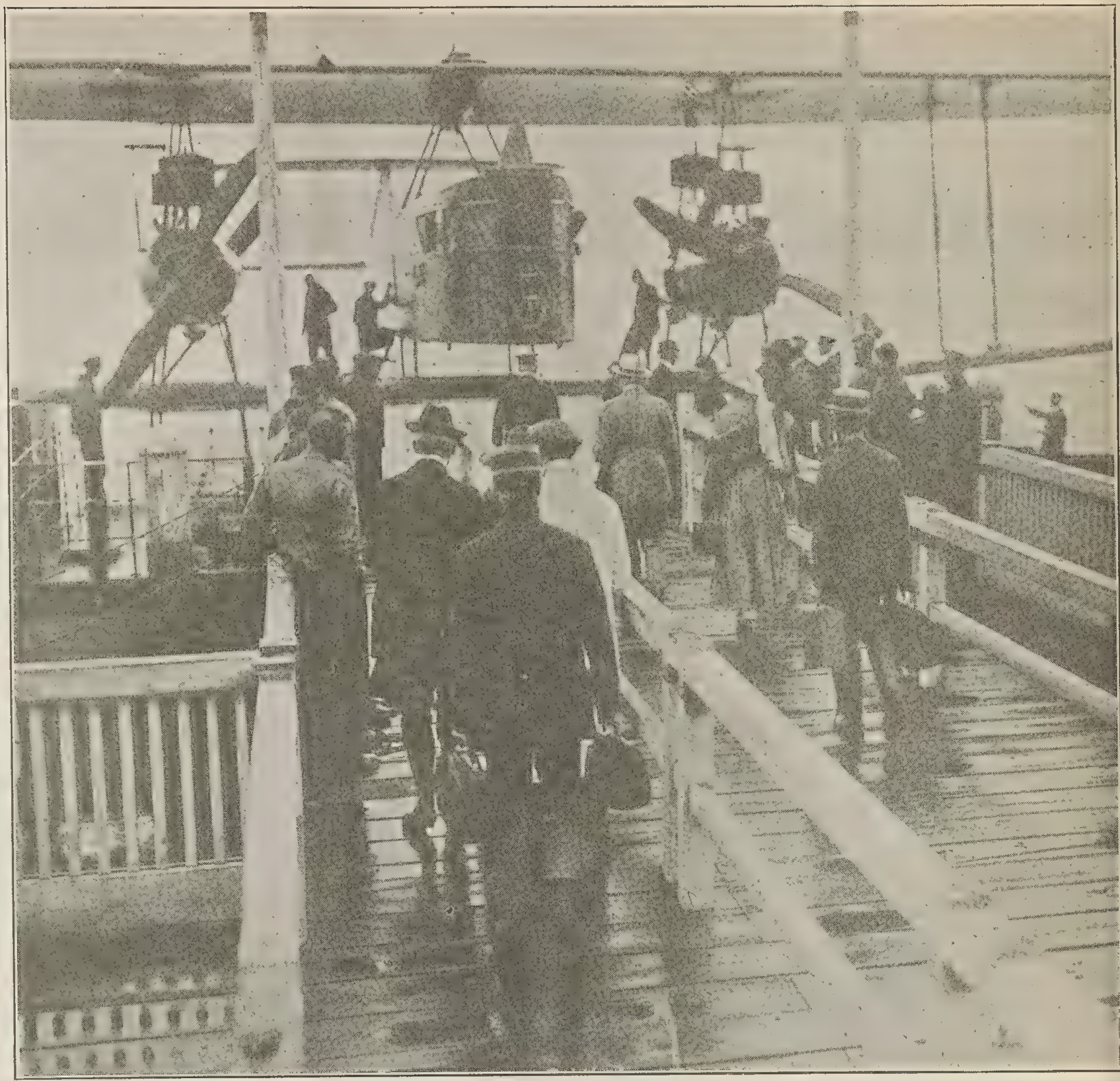
Forty-nine (49) contestants actually got away from Hazelhurst Field and Lieut. Maynard No. 31, Capt. H. C. Drayton No. 47, Capt. J. O Donaldson No 50, 2nd Lieut. L. S. Webster No. 15, 2nd Lieut. Alexander Pearson, Jr., No. 8, 2nd Lieut. H. W. Sheridan No. 40, and Capt. Harry Smith No. 29, gained a substantial lead on the other contenders during the first day and definitely broke away from them the second day. Thus they avoided heavy rainstorms between Buffalo and Rock Island, which seriously held up the other competitors.

Lt. Maynard, arriving at Cheyenne at 6:27 P. M. Thursday, stopped there for the night, but apparently did not empty the drain pipe of his radiator, which froze and broke during the night, and the necessary repairs delayed him until 12:34 P. M. Friday. This enabled Capt. Drayton who had stopped at Des Moines Thursday night, to reach and leave North Platte at 12:30 Friday, four minutes before Lt. Maynard took off from Cheyenne, 205 miles further west. At that time Lt. Webster No. 15 was in third place having left Omaha 20 minutes before and Capt. Donaldson No. 50, was at that moment on the ground in a forced landing between Rock Island and DesMoines, but reached Des Moines at 1:08 and was again actively in the race at 1:39.

Throughout Friday afternoon, these five were running relatively very close together, with all of them driving forward consistently. At sunset Friday night, Maynard was at Salduro, arriving 6:02:05. Drayton had

Men in charge of the Transcontinental Reliability Test

Left to Right—Col. Archie Miller, Assistant Secretary of War Benedict Crowell, Lieut. R. C. Fitzpatrick and Brig. Gen William Mitchell.



Largest of Hydroairplanes Carries Twenty-four Passengers and Crew, With Baggage. It was Built by the new German Republic—Photograph shows Passengers Boarding the ship, each being allowed thirty pounds of Baggage.

stopped at Rawlins, Wyoming, 355 miles behind, at 4:13:10. Webster, at 5:44:30 was at Sidney, 225 miles behind Drayton, and Donaldson at 5:56 was at North Platte, 112 miles behind Drayton.

Saturday morning, October 11, Lieut. Maynard was first to leave getting away from Salduro at 6:47:55 A. M. Webster was next from Sidney at 7:48:45, Donaldson got away from North Platte at 7:50:32, and Drayton from Rawlins at 8:07. Maynard stopped only the required thirty minutes at each of the three control stops between Salduro and San Francisco, and reached the end of his journey at 1:12:07 P. M. At that moment, Drayton was his nearest competitor, being about half-way between Salduro and Battle Mountain, approximately 437 miles away. Webster, in the control at Green River, was next, Donaldson, between Rawlins and Green River, was third; Donaldson reached Green River at 1:41:30 while Webster was still at that stop.

West To East Phase of the Race

2nd. Lieut. E. C. Kiel, driving DH-4 No. 62, was the first east-bound entrant to complete the journey, and was second to Lieut. Maynard, the west-bound winner, in time of arrival and actual flying time. Major Carl Spatz, driving DH-4 Bluebird No. 61, was the second to arrive on the eastern coast, arriving just twenty seconds behind Lieut. Kiel. Major Spatz landed at Hazelhurst Field by mistake, and had to rise again and go to Roosevelt Field, and this delay cost him first place in the east-bound flight, but did not affect his standing as third in actual flying time.

Capt. L. H. Smith with 1st Lieut. F. W. Ruggles as passenger, in DH-4 Bluebird No. 58, led the east-bound contestants at all stations as far east as Rock Island, where he landed at 10:43:29 Thursday. At that time the field at Chicago was so wet that all conetnts were being held at Rock Island and Bryan respectively. Lieut. Kiel No. 62, caught up with Capt. Smith at this point at 12:45:25, being followed by Major Spatz at 12:52:30. When arrangements were made for the use of the postal field at Chicago, these fliers were sent out in the order in which they had arrived, Captain Smith taking off at 1:46:40, followed by Lieut. Kiel at 1:48:20, and by Major Spatz at 1:48:50; thus Capt. Smith was robbed of the two-hour lead over his fellows from the west.

Fine Flying by Captain Smith

Capt. Smith maintained his lead into Chicago by 7 minutes, 16 seconds, being followed by Major Spatz who nosed out Lt. Kiel by 11 minutes, 26 seconds. These contestants maintained the same position in leaving Chicago, and in arriving at Bryan, where all three spent the night. This gave Smith "the honor" and he led off next morning at 6:41, followed by Major Spatz at 6:48:05, and Lieut. Kiel at 6:48:50. Going into Cleveland, Capt. Smith lost his way in a rainstorm, made a forced landing, breaking his propeller, got another from Cleveland by automobile and flew into the field at 12:48:30 and here it was that Major Spatz took the lead.

Major Spatz led Lieut. Kiel into Cleveland, two sets of time being reported for this arrival. One reports Spatz arriving at 8:16:35, the other at 8:19:20, and Lieut. Kiel was first reported arriving at 8:34:12, and later at 8:32:12. Between Cleveland and Buffalo, Lieut. Kiel took the lead, landing at the latter place at 11:48:50, Major Spatz following at 11:51:05. Captain Smith left Buffalo at 12:40:30. Major Spatz was able to get at 4:32:15. Major Spatz was able to get away from Buffalo at 12:50:30, while Lieut. Kiel was delayed until 1:11:31. At Rochester, Spatz arrived at 1:17:30 1-5, Kiel at 1:53:20 20 2-5, and Smith at 5:41:40 2-5. Spatz departed from Rochester at 1:48:30-2-5, and Smith remained for the night.

Spatz led Kiel into Binghamton by 14 minutes, 28 seconds, and led out at 4:58 by 8 minutes, 5 seconds. It was thus a wing and wing race to the finish, where Major Spatz made the mistake which cost him the race by landing at Hazelurst Field instead of Roosevelt Field, and before he could hop out and get to the latter field, Lieut. Kiel had beaten him in by 20 seconds.

Lieut. Maynard First Across

At the instant Lieut. Maynard's wheels touched the ground at San Francisco, (4:12:07 Eastern time) Major Spatz and Lieut. Kiel were on the ground at the control stop at Binghamton, New York, 142 miles from the eastern finish, having landed there at 2:51 and 3:45:32 respectively. Major Spatz flew the distance from Binghamton to New York in 1 hour, 37 minutes, 30 seconds. Had he remained only the required 30 minutes at Binghamton and gone into New York in the same time, he would have ended his journey at 4:58:30, Eastern time, or 1:58:30 Pacific time, 46 minutes 23 seconds after Lt. Maynard reached the wesern coast.

Of the thirteen planes starting from the West, seven were still in the race, four being east of Chicago at the moment Lieut. Maynard landed at San Francisco.

Of the forty-nine planes actually starting from New York, thirty-seven were still in the race, when Lieut. Maynard finished at San Francisco; seventeen of these had passed Chicago.

Rodman Law Dead

Rodman Law is dead. The man who startled thousands of people with his feats of daring died of tuberculosis Oct. 13 in Camp Sevier Hopital, Greenville, S. C., after an illness of there months. He was 34 years old and is survived by his wife and daughter.

Rodman Law made a living by flirting with death. He jumped at great heights from airplanes, buildings and bridges. He did all sorts of hazardous, thrilling exploits that no one else would think of attempting. He was born in Lynn, Mass.

AIRCRAFT JOURNAL

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Loening's Hydro-Monoplane Makes an Altitude Record

Up 18,500 Feet, Piloted by Caleb S. Bragg, In One of Several Experimental Tests

Taking off from the waters of Manhasset Bay, at Port Washington, Caleb S. Bragg, on September 29, made a new world's altitude record of 18,500 feet for a hydro-monoplane carrying a passenger.

Bragg's vehicle was a Loening machine equipped with a 300 hp. Hispano-Sujza engine. He carried into the air with him as passenger and observer Cole T. Younger, Vice Chairman of the Contest Committee of the Amrican Flying Club. Mr. Younger, James B. Taylor and J. Frank Vernon were the Flying Club's official observers, who sealed the aviator's barograph for calibration and will homologate the record.

While the height attained by Bragg is 15,000 feet less than was reached recently by Roland Rohlfs in a Curtiss "Wasp" at Roosevelt Field, Mineola, it is of importance in aeronautics, as a demonstration of the possibilities of a passenger-carrying monoplane of standard type.

Plane Tested for Navy

The Loening plane is one of a lot of 110 contracted for by the United States Navy, and this flight was made in the course of a series of experimetal tests to which they are being put.

It has a wing spread of 35 feet, an over-all length of 25 feet, and a still air speed of 131 miles an hour. It weighs 1,750 pounds light and can carry a useful load of 1,000 pounds.

Part of those to be delivered to the Navy will be hydro-monoplanes and part land machines. It is the announced purpose of the Navy Department to equip every battleship with a small plane of this or some other type capable of taking off from the deck of a vessel on a scouting cruise. The Loening planes are built to mount two machine guns.

In its flight on September 29 the monoplane carried, in addition to its two passengers, 30 gallons of gas, estimated as sufficient for an hour's flight; three gallons of oil and 120 pounds of water. Its total load was calculated at 640 pounds.

Conditions were perfect for flight when, at 5 o'clock, the warming up of the motor began. The machine left the water at 5.11, taking off with remarkable celerity, and headed, with a wide open throttle, toward City Island. When over the open Sound it turned east, climbing rapidly.

Ten minutes later, it was lost to view of the group watching it from the hangar. Its engine was heard on the return some time before the eye could pick up the machine. One hour and twelve minutes after getting away, it dropped down again, a hundred yards from the hangar, after racing an army DH 4, which was out from Mineola.

Fifty Minutes to "Peak"

Three barographs aboard the plane showed varying records, the highest being 21,000 feet. It was fially agreed that 18,500 was the most reliable. Mr. Bragg reported that he had reached the "peak" in 50 minutes, having agreed with his passenger at the start that with the fuel supply aboard, that would be the limit of safety. The machine was still climbing when the moment of return arrived.

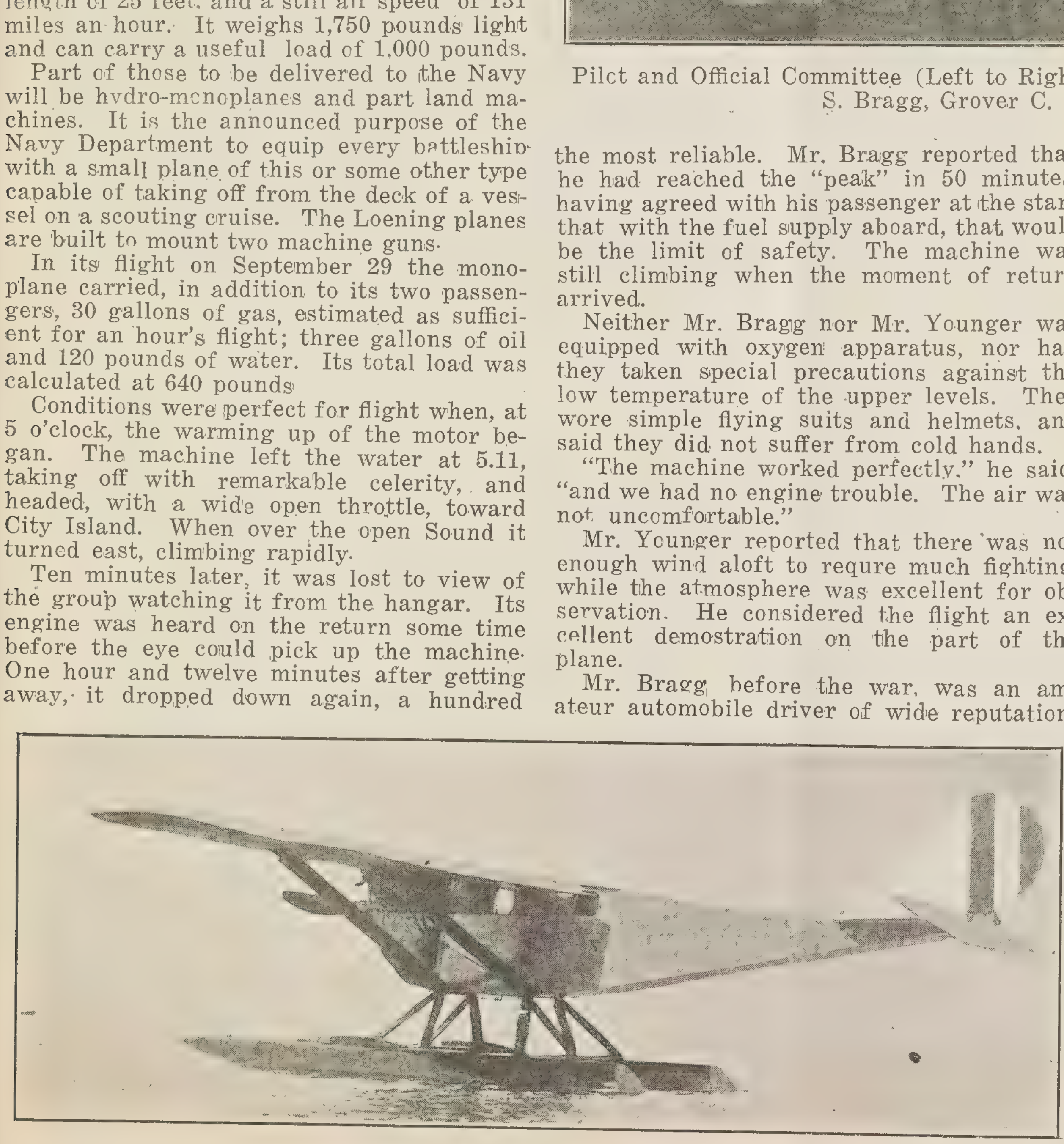
Neither Mr. Bragg nor Mr. Younger was equipped with oxygen apparatus, nor had they taken special precautions against the low temperature of the upper levels. They wore simple flying suits and helmets, and said they did not suffer from cold hands.

"The machine worked perfectly," he said, "and we had no engine trouble. The air was not uncomfortable."

Mr. Younger reported that there was not enough wind aloft to requre much fighting, while the atmosphere was excellent for observation. He considered the flight an excellent demostration on the part of the plane.

Mr. Bragg, before the war, was an amateur automobile driver of wide reputation. During the war he was testing pilot at McCook Field, Dayton, O., and since that time has continued his interest in aviation, always with strictly amateur status. On Sunday he flew the Loening monoplane, with which he set the new record, to an altitude of 16,000 feet, with a passenger.

Pilot and Official Committee (Left to Right) James S. Tayor, Jr., Cole J. Younger, Caleb S. Bragg, Grover C. Loening and Frank Vernon



Loening Hydromonoplane Just Before Its Altitude Flight, Sept. 29

Rohlfs' Barograph

A photograph of the barograph record made by Roland Rohlfs, test pilot for the Curtiss Engineering Corporation in a Curtiss Wasp-model triplane equipped with Curtiss K-12, 400 h. p. engine at Roosevelt Field, on Sept. 18, 1919, was printed in AIRCRAFT JOURNAL of Sept. 27.

The curve in the photograph shows that Rohlf climbed 4,000 feet in three and one-half minutes; 6,000 feet in six minutes; 10,000 feet in eight minutes. The curve then shows that Rohlfs' climb became less steep. At 31,000 feet, the line shows a slight break. It was at this point that Rohlfs ran into what he believed to be an "air pocket." His machine went from one spin into another until the pilot discovered that he had not sufficient flying speed. Rohlf had taken out his air-speed indicator in his efforts to lighten the plane, and had no way of knowing his speed except by "feel." He opened his engine and overcame the difficulty. He reached his ceiling—34,610 feet—in 78 minutes. He then began his descent and the line shows that he reached the ground in 35 minutes. The figures from 0 to 34,000 show the altitnde and those from 30 to 8 represent the barograph pressure. Each space between the curved lines indicates about 3½ minutes.

Washington Aviation School

"Miss Spokane," the airplane built by the Northwest Aircraft Company, is to fly again. Lieut. W. T. Barnard has reached Spokane with a Curtiss JN-4D machine and commenced making daily flights, and the owners have opened an aviation school under the direction of Lieutenant Symonds, a graduate of the Rockwell Field Army School at San Diego, Cal.

Ellington Fliers First to Cross the Continental Divide

Recruiting Squadron Traveled 6,500 Miles in 5,700 Minutes Without an Accident on the Flight

Crews of the First Ships to Cross the Rockies and the Continental Divide

Left to Right: Sergt. A. T. Vierra, Lieut. C. V. Rugh, Lieut. C. C. Nutt (Flight Commander), M. S. E. J. J. J. Kelly, Sergt. J. H. Campbell, Lieut. E. W. Killgore, (Publicity Officer), Lieut. E. H. Nelson and Sergt. G. W. Anderson.

Ellington Field's transcontinental recruiting squadron is back at the field after an absence of two months during which it broke nearly every aviation record and brilliantly executed some of the most striking achievements of the air service.

It has returned, after travelling 6500 miles throughout the central and western portions of the United States without a single loss and with not one accident to mar the perfection of its work. Its flying time was 5700 minutes.

It went to places where airplanes had never been seen before, performed tasks that aviators had never before attempted and covered, not only its members but also its school, the Houston field, with wreaths of honor.

Things Accomplished

Here is what the four aviators from Ellington accomplished:

They were the first fliers to cross the continental divide in the Rocky Mountains.

They carried the first Pacific aerial mail from San Francisco to Sacramento.

They "pounded out" the first newspaper story ever written in a flying plane.

They carried the first bank clearings from one city to another by airplane, taking $108,000 from Ogden, Utah, to Salt Lake City.

They carried the first shipment of gold dust out of Colorado in an airplane.

They covered more mileage without an accident than has ever been covered before.

They made an average flying showing of 100 miles an hour for 6500 miles.

This is only a brief summary of the accomplishments of the flight. It represents only a small part of the activities of the eight men who went from Ellington Field to spread the gospel of the Air Service throughout the land.

Honor To These Fliers

The party was headed by First Lieutenant Clifford C. Nutt, and included three fliers, First Lieut. Edward W. Killgore, Secound Lieut. Charles V. Rugh and Second Lieut. Erick H. Nelson, and four enlisted men, Master Signal Electrician John J. Kelly, and Sergeants First Class John H. Campbell, A. T. Verra and G. W. Anderson.

They left Houston on July 10 on a recruiting campaign for the aviation service, and were enlisting eight men a day on an average, they reported on their return. Recruiting, however, was stopped at Salt Lake City on orders from the War Department to cease seeking new men for the aviation service.

This order caused the unit to abandon plans for a swing across the country to the Atlantic coast and forced it home earlier than it would have come and, probably, with a few less records.

The trip over the Rockies, the paramount achievemnt of the flight, is regarded by the men as the most spectacular feature of their voyage.

Over Pike's Peak

The machines flew over Longs Peak, as well as Pike's Peak. Long's is the highest point in the Rockies, 15,000 feet above sea level, and, the aviators said, so rugged that a bird flying down to it would break its neck trying to effect a landing.

At Glenwood Springs, up in the Rockies, a landing was made at 6200 feet and baggage was expressed ahead so that the ships would be as light as possible. The journey, 17,000 feet up in the air, over the divide, was made, however, without the use of any artificial devices such as have been used by other aviators in making the greatest heights.

It was while they were playing around up in this rarified atmosphere and speculating on the ruggedness of the cliffs that they found themselves lost, lost in the top of the Rockies where they could stay for a decade without being found! For an hour and a half one day, the officers reported, they wandered around the tops of the highest mountains trying to get their bearings.

At Salt Lake City they took the father of Senator Smoot, an original forty-niner, over mountains in 10 minutes that it had taken him four months to cross when he went out as a pioneer.

In the Wilds

At no place were the fliers awaited with such eagerness as in the Uneeda Basin in Utah, where hundreds of inhabitants have never seen a railroad train, much less an airplane.

Two weeks before their arrival, Indians and other inhabitants camped out near where they were to land to await the arrival and when they did glide down upon them they were amazed.

"Humph. Roads muddy. Automobile fly," was the verdict of one old chief.

The fliers brought word from the governor of Utah to the people of the Basin of the railroad to be built.

The whole trip was made in four DeHaviland Liberty motored ships and was, the lieutenants say, a complete triumph for the Liberty motor. The motors never missed, they say.

Gassed in Utah

Only twice were they in real danger. That was when an unexpected gas attack was launched upon them.

When the aviators flew over the Guggenheim copper smelter at Salt Lake City, the fumes from the gas nearly succeeded in putting an end to the triumphant journey, but they managed to get over before any damage was effected.

At Tuscon, Arizona, they rushed into a landing only 10 minutes ahead of the worst storm Arizona had seen in 20 years. For miles they had seen the storm coming and, full steam ahead, had beaten it by a length to the city.

The first newspaper story from an airplane was written by Lieut. Killgore on a typewriter while his mechanic piloted the ship. It was a 200-word description of "San Francisco From the Air," made for a San Francisco paper, and was dropped onto the newspaper building as the machine passed.

The carrying of bank clearings from Ogden to Salt Lake saved the bank six hours in interest and insurance on the $108,000, due to difference in speed of delivery.

The first airplane gold dust shipment out of Colorado was of $200 taken to Cheyenne.

Airplanes for Surgeons

Dr. Fred M. Boso, Tulsa, Oklahoma, had an emergency call to Claremore, Oklahoma, distance 25 miles recently. It was imperative that he be there the quickest possible time in order to operate. He left Tulsa at 5 o'clock in the afternoon, and after operating, returned to Tulsa at 7.20. He was gone approximately two hours, and performed a very serious operation, which probably saved the life of his patient. Upon his return, Dr. Boso immediately placed an order for a Curtiss Oriole.

Christening of Curtiss Transport Airplane Eagle

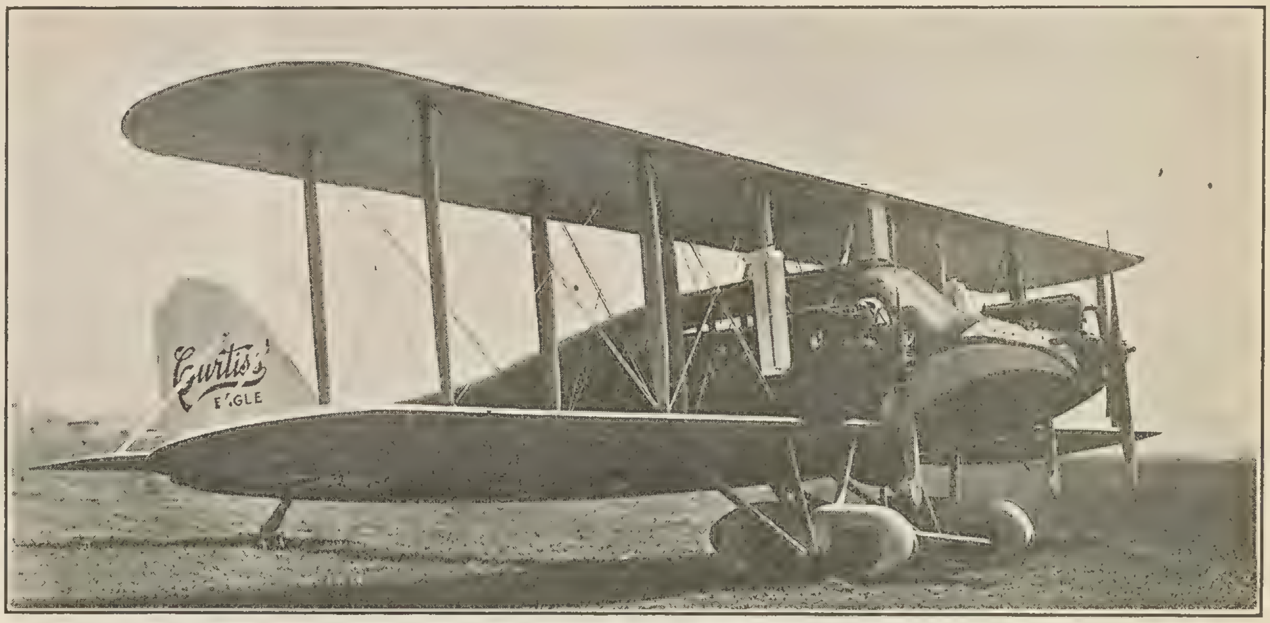
Designed to Meet the Needs of Commercial Aviation, Carrying Large Loads at Small Cost

A new airplane—essentially different from any other type of aircraft in existence and a marked step in advanced aeronautical design and construction—designed and built by the Curtiss Airplane and Motor Corp., made its first public flight at Roosevelt Field Sept. 29, under the guidance of Roland Rohlfs, holder of the world's altitude record.

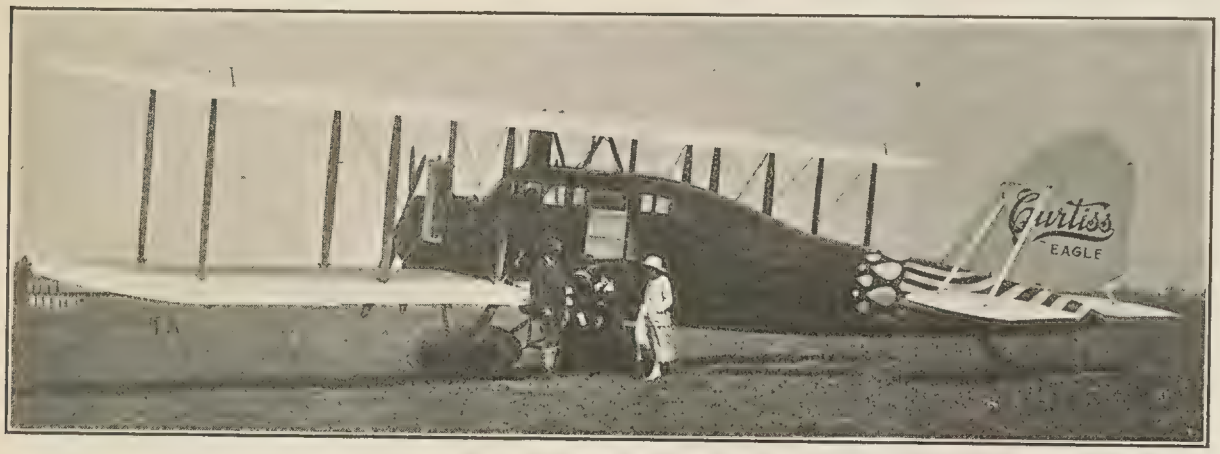
Although the Curtiss Eagle has been successfully flown for the last two months, no announcement of its appearance was made until officials of the company were completely satisfied with the result of exacting tests.

The Eagle is the first three-motored land machine to be produced in America. Three of the new Curtiss K-6 150 hp. motors furnish its motive power and carry the plane through the air at the rate of 107 miles per hour.

The Eagle is not a war adaptation. Like the new Curtiss Oriole, three-passenger land machine, the Eagle was designed to meet the needs of the commercial aviation for a plane capable of carrying a large load at an economical cost. It belongs to the medium-size class of planes.



Three Quarter Front View of the Eagle



Three Quarter Rear View of the Eagle

The fuselage—an enclosed limousine body—fitted as luxuriously as the interior of the modern motor car de luxe. Eight individual wicker chairs arranged in two rows, with spacious aisle between, whipcord lining, dome light, flat windows of triplex nonbreakable glass, curved windows of celluloid.

Designed to carry six passengers and two pilots or seven passsengers and one pilot. Leaving out the seats, the Eagle can be used as a commercial carrier with a useful load of a ton.

Exceptionally adapted for cross-country aerial transportation.

Developed to meet demand for a safe, reliable and economical commercial plane—in these three qualities greater perfection has been attained than ever before.

Performance and Specifications

Performance: High speed, 107 miles per hour. Low speed, 54.6 miles per hour. Climb, 4,075 feet in ten minutes. Radius, 350 miles at full power in 3 1-3 hours; Radius 475 miles at economical speed in 6 1-3 hours.

Power plant: Three Curtiss K-6 motors, 450 hp.

Specifications: Wing span, 61 ft. 4 in. Wing chord, 6.75 ft. Wing area, 770 sq. ft. Gross weight, 7450 lbs. Useful load, 2320 lbs.

Machine will fly well on any two motors. At three-quarters load or at end of journey when weight of gasoline has been reduced, the macine will fly on one motor. With almost full load at 6,000 feet altitude, with two motors cut out, Eagle will glide ten miles to a safe landing. These features make the machine one of the safest ever constructed, making possible long trips and triple assurance against motor trouble.

"Dep." Control

Control is dual Deperdussin, pilot seat in front cockpit and fully protected from wind and cold by two enclosed windows which allow no draught but which give pilot clear vision. One pilot can guide the machine easily, but equipment is provided for two in case of long trips.

Space in rear compartments for baggage.

Eagle will run 6 1-3 hours with full load at cruising speed of 75 miles per hour.

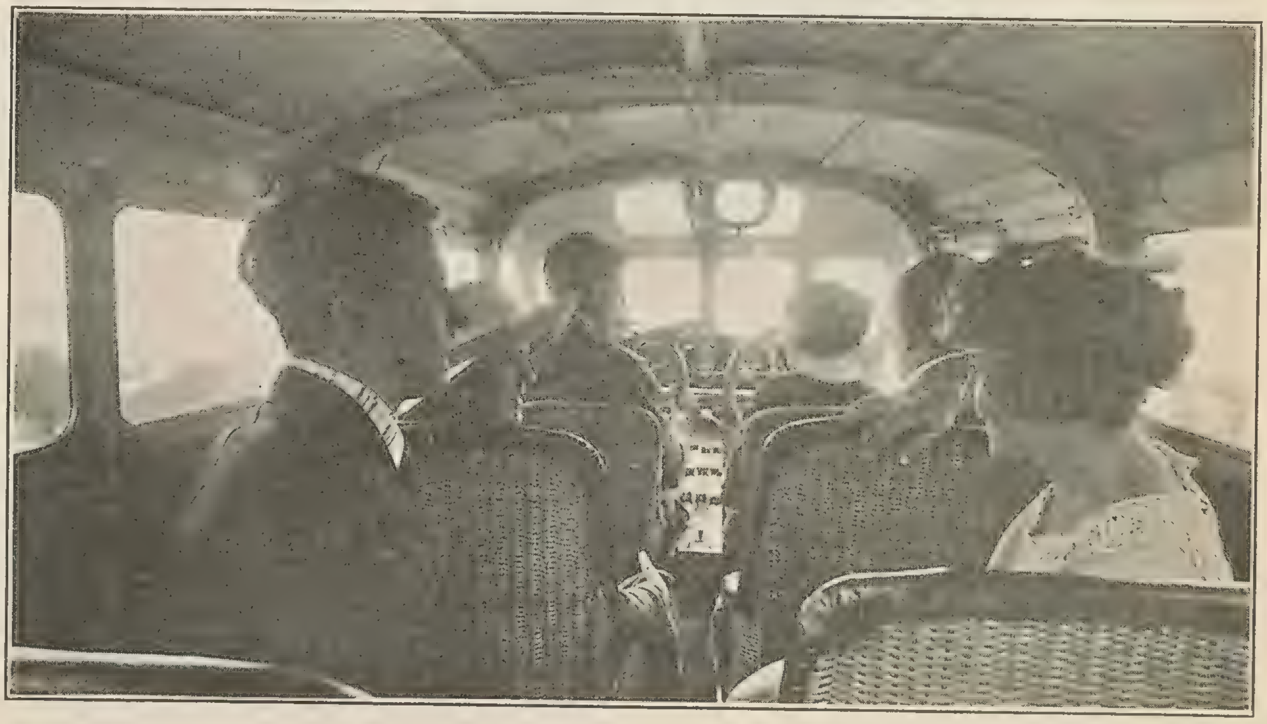
Motors equipped with self starters.

Landing chassis is novel and adds to safety. On the Eagle four wheels are used arranged in tandem pairs and so constructed as to remove all possible jars in landing even on rough ground.

Main fuselage is of streamline form, built of plywood and giving lightness as well as strength.

Motors—one mounted in the fuselage proper and others on either side in nacelles in wing panels.

Machine painted dark brown.



Seating arrangements in the Enclosed Cabin of the Curtiss Transport Biplane Eagle

L. D. GARDNER. . *President and Editor*
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Formerly Air Service Journal

Concerning Spares

RECENT inquires on behalf of a prospective purchaser of a number of planes developed the somewhat surprising conclusion that no great consideration has been given to the question of spares by manufacturers.

No lists of spares for either plane or motor were available, not even an approximate price list could be given.

With the increasing education and knowledge of the public in matters aeronautical, it is quite certain that purchasers will in the great majority of cases inquire about spares. Even if they do not, it should be the duty of the manufacturers to inform them on the subject and facing the situation squarely to insist on the necessity of purchasing spares.

As to what constitutes the best selection of spares, some discussion is possible. Cables can always be cut to required length and specified, but no hangar machine can replace a broken skid. Propellers are easily damaged, and a spare one should always be on hand. It is rare that a wing rib has to be replaced. Each item has to be weighed carefully and the desirability of including it carefully considered. As to the expense, the manufacturer's cost sheets should enable him to give very accurate figures.

Offset Radiator

A VERY curious feature of one German machine built during the war was the setting of the engine at a small angle three or four degrees to the longitudinal axis of the plane. There is no doubt that this was done to counteract the effect of the propeller slipstream on the rudder, which in the average machine necessitates a slight but continuous rudder action. It might also have been employed to counteract the yawing effect of a wash-in on the wings used to balance propeller torque.

A well known air service officer of considerable distinction in aeronautics has recently suggested that the same objects might be attained by using a free air radiator placed on one side of the fuselage only, providing an unequal resistance on either side of the machine. Besides achieving this object, the cooling system on the side radiator would be considerably simplified thereby, as duplication of the leads would be avoided.

Without very careful consideration, it is hard to say whether this suggestion is entirely practicable, but it would seem worth while the consideration of designers.

Rudder on a Small Twin-Engine Machine

AGAIN and again the designer of a twin-engine machine is faced with the problem of the best rudder disposition. On a twin-engine job of moderate dimensions with a span between fifty and sixty feet, it is quite possible to meet rudder requirements with a single large surface, which although somewhat heavier than a twin rudder construction, has the advantage of simplicity and less aerodynamic resistance, and is generally a much neater job.

On the other hand, the necessity of a twin rudder is urged on the grounds that the rudders are then more effective because they are more largely affected by the slip stream, and also because they do not become inoperative in taxying.

But in taxying, the engines themselves can be made to do the work of the rudder, and the effect of slip stream is sometimes disconcerting. A pilot becomes used to a powerful effectiveness of the twin rudders in the slip stream, and forgets to make allowances on a glide.

On the whole it would seem as if on a twin engine machine of moderate dimensions a single rudder would offer better possibilities.

Airplanes in the Open

AN English writer has recently advanced the opinion that the time has come for the serious consideration of the possibility of dispensing with sheds or hangars for the storage of large machines. The very large airplane shed housing entails not only large expenditures in the hangar or shed itself, but also a great many men and additional tackle to get the machines in and out of the hangar. On the other hand, housing in of the airplane offers obvious advantages. Repairs can be executed in comfort and there is a large gain in the life of the machine. Particularly as regards fabric there is a serious difficulty in protecting the machine out in the open. Also if machines are left out in the open some sort of mooring turn tables would have to be provided. It cannot be said that the question is so far capable of a definite solution in the present state of our knowledge. But, the question that Mr. Thompson raises is one worthy of serious thought.

Flying Boat Construction

IT is most intersting to see first in the famous Navy N C boats, now in the Vought VE-10, the combination of a short flying boat hull, with outrigger construction for the tail surface supports. It is claimed by some designers that a short hull means getting on to the step more quickly, a quicker get-away, lower head resistance in the air, and lower construction weight. This is not unreasonable to expect, and claims have apparently been justified by both the above designs.

It is probable, however, that the outrigger type of construction for a flying boat will be more largely followed in the very large sizes where it is almost imposible to support the tail surfaces on the ordnary flying boat hull and yet maintain weights of construction within reason.

Streamline Wire

LIEUT. B. W. MAYNARD, the now famous pilot of the Transcontinental Race, announces his intention of trying a two-day flight from coast to coast during November in a DeHaviland equipped with streamline wire.

There are many ways in which the possibilities of streamline wire may be investigated—by strength tests, bending tests, vibration tests, and chemical analysis.

No doubt exists that streamline wire does enable valuable gains to be made in speed and climb. It is its endurance in long sustained flight, under heavy flying condtions, which is sometimes in doubt. It is encouraging to see a skilled and experienced pilot such as Lieutenant Maynard undertaking a long flight with full confidence in streamline wire, and its behavior on this practical test will be a matter of considerable interest.

Sixty-Six Aces

Sixty-six American aviators earned the coveted title of "Ace" during the war, according to the final and complete list compiled by the Army Air Service and made public through the American Flying Club. These men served with the British, French and American air services.

There are other aviators who are credited unofficially with having brought down five or more planes during the war, but only those men who had five or more victories officially registered are in the list. Lieut. H. H. George is credited with four officially, and unofficially with a fifth, all during the eleven days before the armistice.

Official aces alone destroyed 483 enemy aircraft, including observation balloons, according to Army Air Service reckoning. Of this bag 428 were planes The complete list of aces follows:

Aces and Their Deeds.

Ace	Squadron	Planes	Balloons	Tot.
Capt. Rickenbacker, E. V.	94th	22	3	25
2d Lt. Luke, Frank	27th	4	14	18
Maj. Raoul Lufberry	94th	17	..	17
1st Lt. Vaughn, G. (R. A. F.)	17th	12	1	13
1st Lt. Kindley, Fred	148th	12	..	12
1st Lt. Putnam, D.	139th	12	..	12
1st. Lt. Springs, E.	148th	11	..	11
1st Lt. Landis, Reed (R. A. F.)	40th	9	1	10
1st Lt. Swaab, J. M.	32d	10	..	10
1st Lt. Wright, C. E.	93d	8	1	9
1st Lt. Baer, P. F.	103d	9	..	9
1st Lt. Cassady, T. G.	28th	9	..	9
1st Lt. Clay, H. R.	148th	8	..	8
1st Lt. Hamilton, L. (R. A. F.)	3d	5	3	8
1st Lt. Wehner, Joseph	27th	2	6	8
2d Lt. Donaldson, S. (R. A. F.)	32d	7	1	8
2d Lt. Jones, C.	22d	8	..	8
1st Lt. Hunter, F. O. D.	103d	7	1	8
1st Lt. Beane, J. B.	22d	6	2	8
Maj. Meissner, J. A.	147th	7	1	8
Capt. Coolidge, H.	94th	5	3	8
2d Lt. White, W. W.	147th	7	1	8
2d Lt. Burdick	17th	7	..	7
1st Lt. Larner	103d	7	..	7
1st Lt. Holden, L. C.	95th	2	5	7
1st Lt. Erwin, W. P.	1st	7	..	7
1st Lt. Creech, S. C.	148th	7	..	7
1st Lt. Cook, H. W.	94th	4	3	7
1st Lt. Chambers, Reed	94th	6	..	6
1st Lt. Campbell, D.	94th	6	..	6
1st Lt. Rummell, L. J.	93d	6	..	6
1st Lt. Stenseth, M.	28th	6	..	6
1st Lt. Stovall, W. H.	13th	6	..	6
1st Lt. Guthrie, M. K.	13th	6	..	6
2d Lt. Hays, F. E.	13th	6	..	6
1st Lt. Hammond, L. C.	91st	6	..	6
1st Lt. Robertson, W. A.	139th	6	..	6
1st Lt. Curtiss, E. F.	95th	6	..	6
1st Lt. Sewall, S.	95th	4	2	6
2d Lt. MacArthur, J.	27th	6	..	6
Capt. Vasconcelle, J. C.	27th	5	1	6
2d Lt. Knotts, H. C.	17th	6	..	6
2d Lt. Ponder, W. T.	103d	6	..	6
1st Lt. Tobin, E. G.	103d	6	..	6
1st Lt. Grey, C. J.	213th	4	1	5
1st Lt. O'Neil, R. A.	147th	5	..	5
2d Lt. Porter, K. L.	147th	5	..	5
1st Lt. Healy, J. A.	147th	5	..	5
1st Lt. Furlow, G. W.	103d	5	..	5
2d Lt. Todd, R. M.	17th	4	1	5
Major Hartney, H. E.	27th	5	..	5
Capt. Peterson, O. K.	95th	5	..	5
1t. Lt. Buckley, H. R.	95th	4	1	5
1st Lt. Knowles, J.	95th	5	..	5
Capt. Strahm, V. H.	91st	5	..	5
2d Lt. Badham, W. T.	91st	5	..	5
1st Lt. Cook, E. R.	91st	5	..	5
1st Lt. Lindsay, R. O.	139th	5	..	5
1st Lt. Schoen, K. J.	139th	5	..	5
1st Lt. Searley, J. J.	13th	5	..	5
1st Lt. Blair, H. L. (R. A. F.)	24th	5	..	5
1st Lt. Luff, F. E. (R. A. F.)	74th	3	2	5
1st Lt. Ralston, C.	148th	5	..	5
1st Lt. Bissell, C.	148th	5	..	5
Major Thaw, William	103d	4	1	5
1st Lt. Brooks, A. R.	22d	5	..	5

Price Paid By America

The price paid by America in destroying the wings of the Hun armies is told in a brief statement. This shows that there were thirty-two fliers killed and thirty-nine injured in accidents behind the lines. In action with the enemy 187 fliers were killed, 133 wounded, forty-seven marked missing, and 145 taken prisoner by the Germans. This list, with the service to which they were attached, is as follows:

	Killed	Wounded	Missing	Prisoners
With Independent Air Force	3	2	2	7
With French Squad.	11	13	..	1
With R. A. F. Squad.	15	12	7	14
With 17th B. E. F. Squad	8	6	3	8
With 148th B.E.F. Squad	3	3	1	4
With Italian A. F.	2	..	..	1
1st Army, A. E F.	145	97	34	106
With 2nd Army, A. E. F., 8th Squad	..	..	..	..

From the above it will be seen that the activities of the American airmen under their own flag, as members of the American Expeditionary Force, were many times that of their brothers fighting under allied flags.

A. F. C. Enlarged

Members of the American Flying Club have entered into possession of the addition to their club house, at No. 11 West 38th Street. They now occupy two entire connecting buildings. On the first floor of the new building is the dining room which occupies the whole floor. On the second floor is a trophy room. Here space is allotted to every American squadron for its war trophies and records. The third and fourth floors will be sleeping quarters and bathrooms. The club now has a membership of 1,300.

Fate of Z-72

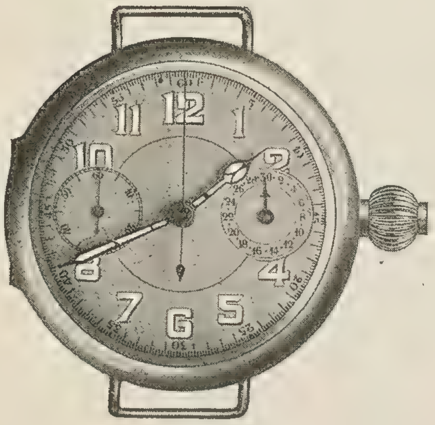
With the time for the surrender of Germany's aerial forces to the Allies and America drawing near, the Zeppelin Works are preparing to put up a fight against giving up the Z-72, the largest airship in the world. They claim it never was taken over by the military and therefore does not come under the provisions of the peace treaty.

!AVIATORS!

WRIST CHRONOGRAPHS

PLAIN AND LUMINOUS DIALS

ILLUSTRATION SHOW



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The only practical "Aviators" split wrist chronograph. 18 jewels. Sterling silver case. Hands and figures treated with a special two year guaranteed radium material passed by U. S. Gov. Furnished with special "Aviators" wrist strap. Suitable for wearing outside of coat sleeve. Price, Net, $60.00

While the large Army and Navy land and water machines have chronometers on the instrument board, an accurate split second wrist watch for pilot, navigator and mechanician is also an essential. For ordinary commercial airplane work the wrist chronograph makes an effective substitute for the more expensive chronometer, and in addition has many uses about the airdrome in checking tachometers, R.P.M.'s on the test block, take off, landing speeds, etc.

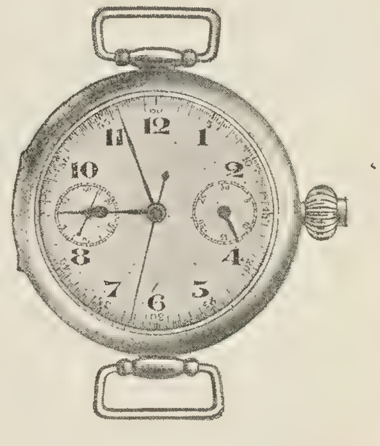
In addition to the one worn by Lieut.-Commander Read several of these wrist chronographs were used on the trans-Atlantic flight of the NC ships.

The chronographs are used for taking the time of passing objects, for astronomical observations. for use in connection with the instrument for determining speed over the ground, and for general use in determining time intervals.

Commenting upon the use of his wrist chronograph on his overseas flight, Commander Read said:

"The 'stop' feature incorporated in an accurate time-keeper is of considerable value where absolutely exact intervals of time are required. This is used in flying to obtain the speed of the plane over the ground, a matter very desirable to know in oversea trips, and also necessary in determining speed of new types of planes and in calibrating speed meters. To have the 'stop' feature in a wrist watch increases the convenience of operating it."

ILLUSTRATION SHOWS



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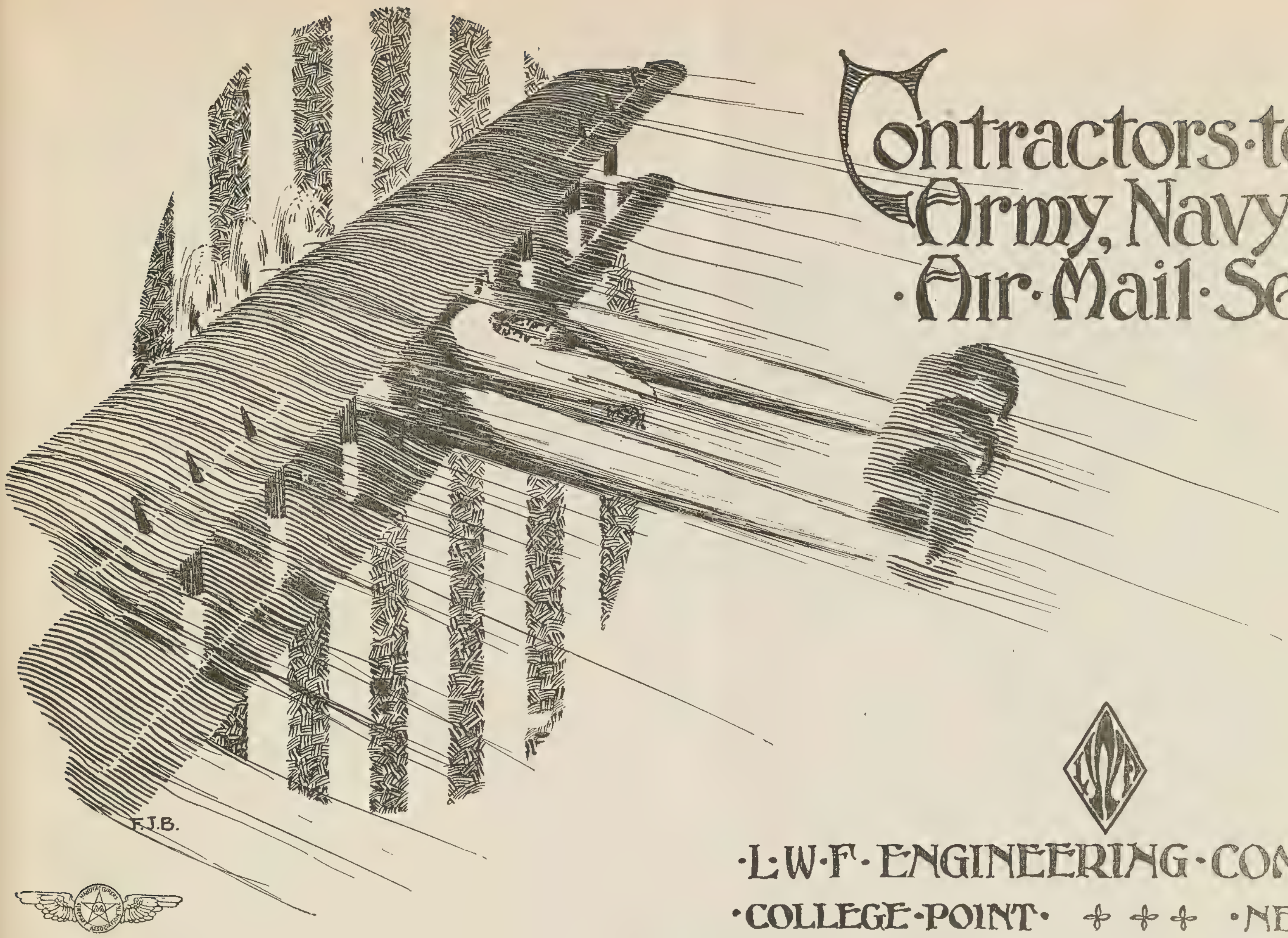
AIRCRAFT JOURNAL of November 1st will print a complete and exhaustive review of the aeronautical crisis; also the conclusions of the Board of Officers appointed by the Secretary of War to report on commercial aviation, a separate department of aeronautics and other matters of vital import to the aircraft industry.



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N. A. Committee Meets

The annual meeting of the National Advisory Committee for Aeronautics was held in Washington on Thursday, October 9. Dr. Charles D. Walcott was elected Chairman for the ensuing year, and Dr. S. W. Stratton Secretary. Members of the Executive Committee were elected as follows: Dr. Joseph S. Ames, Colonel Thurman H. Bane, U. S. A., Captain Thomas T. Craven, U. S. N., Dr. John F. Hayford, Professor Charles F. Marvin, Major General Charles T. Menoher, U. S. A., Dr. S. W. Sratton, Rear Admiral D. W. Taylor, U. S. N., and Dr. Charles D. Walcott.

The Executive Committee proceeded to organize for the coming year and elected Dr. Joseph S. Ames Chairman, and Dr. S. W. Stratton Secretary.

The appointment of Professor George W. Lewis as Executive Officer was confirmed. Estimates for the fiscal year 1921 were approved in the sum of $437,000.

In addition to the functions specifically defined for the various subcommittees, the general functions of the committee were defined as follows:

First: Under the law the Committee holds itself at the service of any department or agency of the Government interested in aeronautics for the furnishing of information or assistance in regard to scientific or technical matters relating to aeronautics.

Second. The Committee may also exercise its functions for any individual, firm, association or corporation within the United States, provided that such individual, firm, association or corporation defray the actual cost involved.

Third. The Committee institutes research, investigation and study of problems which, in the judgment of its members or of the members of its various subcommittees, are needful and timely for the advance of the science and art of aeronautics in its various branches

Fourth. The Committee endeavors to keep itself advised of the progress made in research and experimntal work in aeronautics in all parts of the world, particularly in England, France and Italy, and will extend its efforts to the securing of information from Germany and Austria.

Fifth. The information thus gathered is brought to the attention of the various subcommittees for consideration in connection with the preparations of programs for research and experimental work in this country and by them it is then submitted promptly to the military and naval air service and other branches of the Government, university labratories, and aircraft manufacturers interested in the study of specific problems.

Sixth. The Committee holds itself at the service of the President, the Congress, and the executive departments of the Government for the consideration of special problems which may be referred to it, such as rules for international air navigation, method of regulation and development policies of the military, naval, and air services, etc

Itinerary of the NC-4

The Navy Department announces the itinerary arranged for the NC-4, the huge flying boat that made the first trans-Atlantic flight, upon its departure from Washington. The trip, which is being made to stimulate recruiting as well as to give the public a chance to see the historical craft, will include a visit to cities on the Mississippi and Ohio rivers. All of the dates are subject to change should weather conditions necessitate it.

The date given below of the departure from a town is the same as the date of arrival at the next stopping point. Naval recruiting officers all along the route will be kept informed of the progress made by Lieut. Read and the NC-4. Following is the tentative schedule:

Washington, D. C.	Oct. 18
Norfolk, Va.	Oct. 23
Charleston, S. C.	Oct. 27
Savannah, Ga.	Oct. 27
Jacksonville, Fla.	Oct. 30
Miami, Fla.	Nov. 3
Pensacola, Fla.	" 5
Memphis, Tenn.	" 6
Cincinnati, Ohio	" 10
Louisville, Ky.	" 13
Owensboro, Ky.	" 15
Evansville, Ind.	" 17
Paducah, Ky.	" 19
St. Louis, Mo.	" 22
Cairo, Ill.	" 25
Memphis, Tenn.	" 29
Helena, Ark.	Dec. 1
Arkansas City, Ark.	" 3
Greenville, Miss.	" 5
Vicksburg, Miss.	" 8
Natchez, Miss	" 10
Baton Rouge, La.	" 13
New Orleans, La.	" 17
Galveston and Houston, Tex.	" 20
Mobile, Ala.	" 22
Pensacola, Fla.	" 22

O. P. WILSON NOW V. P.

At a recent meeting of the directors of The Norma Company of America, O. P. Wilson, who has been assistant general manager for several years, was elected vice-president of the company. W. M. Nones continues as president and treasurer in executive charge of the company's affairs.

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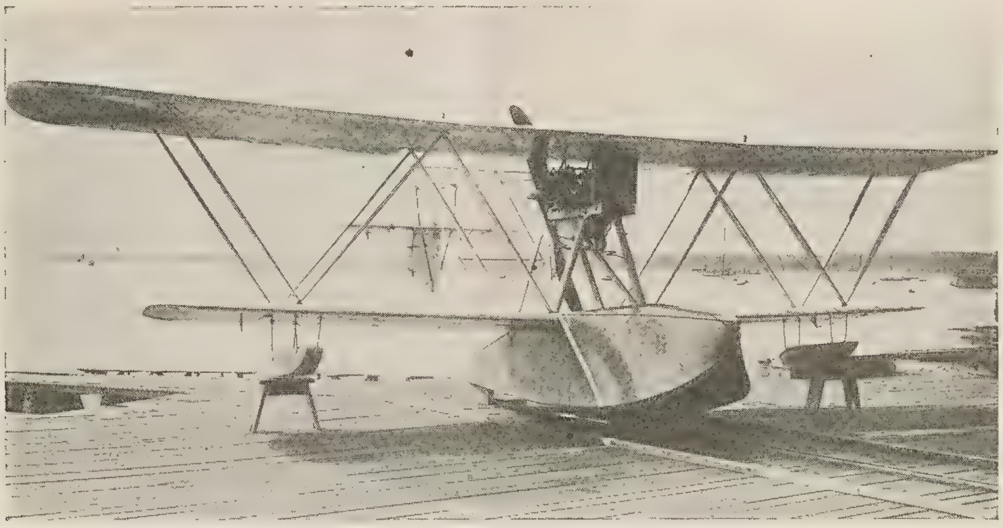

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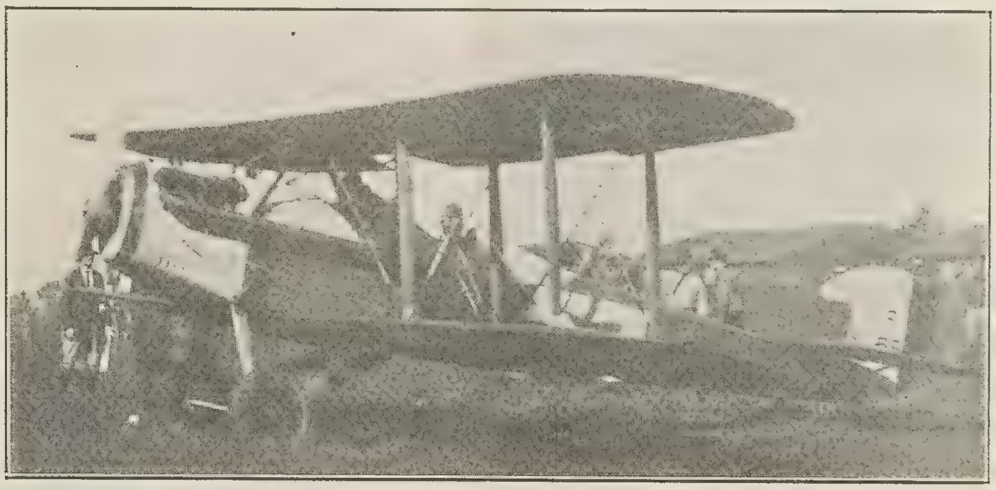

¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

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Handley Page Plans

A luncheon given by the American Flying Club on October 16 to Admiral Mark Kerr, Major Herbert G. Brackley and W. H. Workman, of the Handley Page Co., served as a setting for the announcement of the immediate plans of the company in the United States and a schedule of flying demonstrations by the four-engined super Handley Page bomber.

Admiral Kerr reveiwed the events beginning with despatch of the Handley Page expedition to Harbor Grace and the entry of the machine in the Trans-Oceanic contest. Alcock and Brown, he said, took the air for their successful flight half an hour before the big bomber. Their flight, said the Admiral, "took the wind out of our sails" and it was decided that another attempt to fly the Atlantic would serve no good purpose. The Company then decided to send the machine to Atlantic City on a non-stop flight. The forced landing at Parrsboro, Nova Scotia, was due to a broken oil feed line in one of the four Rolls-Royce engines. This particular engine, said the Admiral, continued for twelve hours after the oil line went out. In telling of this remarkable performance Admiral Kerr spoke most feelingly of "the good old Rolls." They continued on three engines until what appeared to be a satisfactory place to land was located at Parrsboro. The field, however, proved to be a bog; the wheels sank through the soft turf and the big machine nosed over, necessitating repairs which occupied several weeks. The machine again took off making a nonstop flight from Parrsboro to Greenport, L. I. where it descended for gas and fuel, strong winds having caused the exhaustion of a supply which would normally have carried the machine to Mineola. The subsequent flight to Mineola and the circles which the big bomber made above the Woolworth Building have been liberally described.

A non-stop flight from Mineola to Chicago is now scheduled for next week. Admiral Kerr stated that commercially a continuous flight of this length was not a sound proposition, because of the necessity of giving up cargo space to gas. He had acceded to the advice of American transportation interests, however, who stated that the American public would be more impressed with the longer initial fight. In the Admral's opinion a one stop flight between New York and Chicago would prove commercially advantageous for large machines of the Handley Page type.

The Admiral also related a report he had made to the British Air Ministry upon the 5,000 Americans he commanded in a certain air operations area in France. This report was highly complimentary to the initative and cooperaton of the American officers under him and of the enlisted personnel. His British perceptions were touched by the well-dressed appearance of the officers and neatness of the men. While the Admiral failed to make mention of any aridity in his area, he did say that the American officers and enlisted personnel never showed the effects of drinking, indicating that the Admiral admires a man who carries his liquor well.

The Army's trans-continental race came in for praise by the Admiral as a pioneer effort, the lessons of which would go a long way toward placing air transportation on a permanent and sound basis.

The Atlantic landed at Greenport, L. I., Oct. 9, and proceeded to Mitchel Field, Mineola, Oct. 13.

NEW AERO CLUB HOUSE

The Aero Club has leased the property at 112 West Fifty Ninth Street for a club house.

U. S. Did Not Sign

The United States did not sign the International Air Convention in Paris, Oct. 13, although it is recognized as one of the most important agreements growing out of the war, for the reason that the American Patent Office objected to some of its provisions. The American Mission did not agree with the contentions of the Patent Office, but was forced to grant its request for more time to study the agreement and to withhold its signature.

The Patent Office contended that the agreement deprived the United States o jurisdiction over prosecutions for patent infringements for the reason that under the terms of the convention if a foreign machine containing a device which infringed an American patent landed in the United States no prosecution could be instuted. Americans here believe that eventually this contention will be waived.

ROOF FOR LANDING

The roof of the Lisel Garage of Carinda, Iowa, is being converted into an airpane sta- can take off. The building covers a quarter of a block and is one of the largest in southwestern Iowa.

CLASSIFIED ADVERTISEMENTS

Rates, 25 cents per agate line per insertion. Black face type, 50 cents per agate line. Forms close Saturday preceding date of publication.

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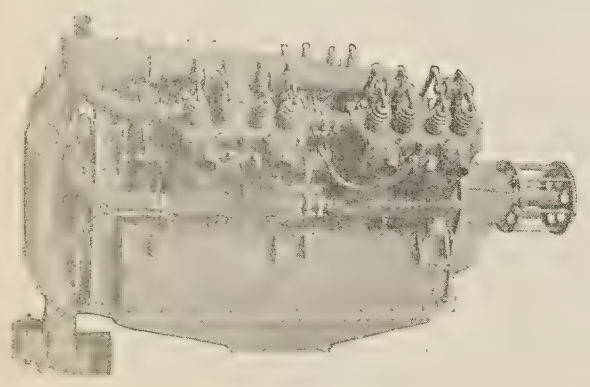

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Of 1524 "Bristol Fighter" Aeroplanes completed in England at the same date 1364 were fitted with ROLLS-ROYCE ENGINES

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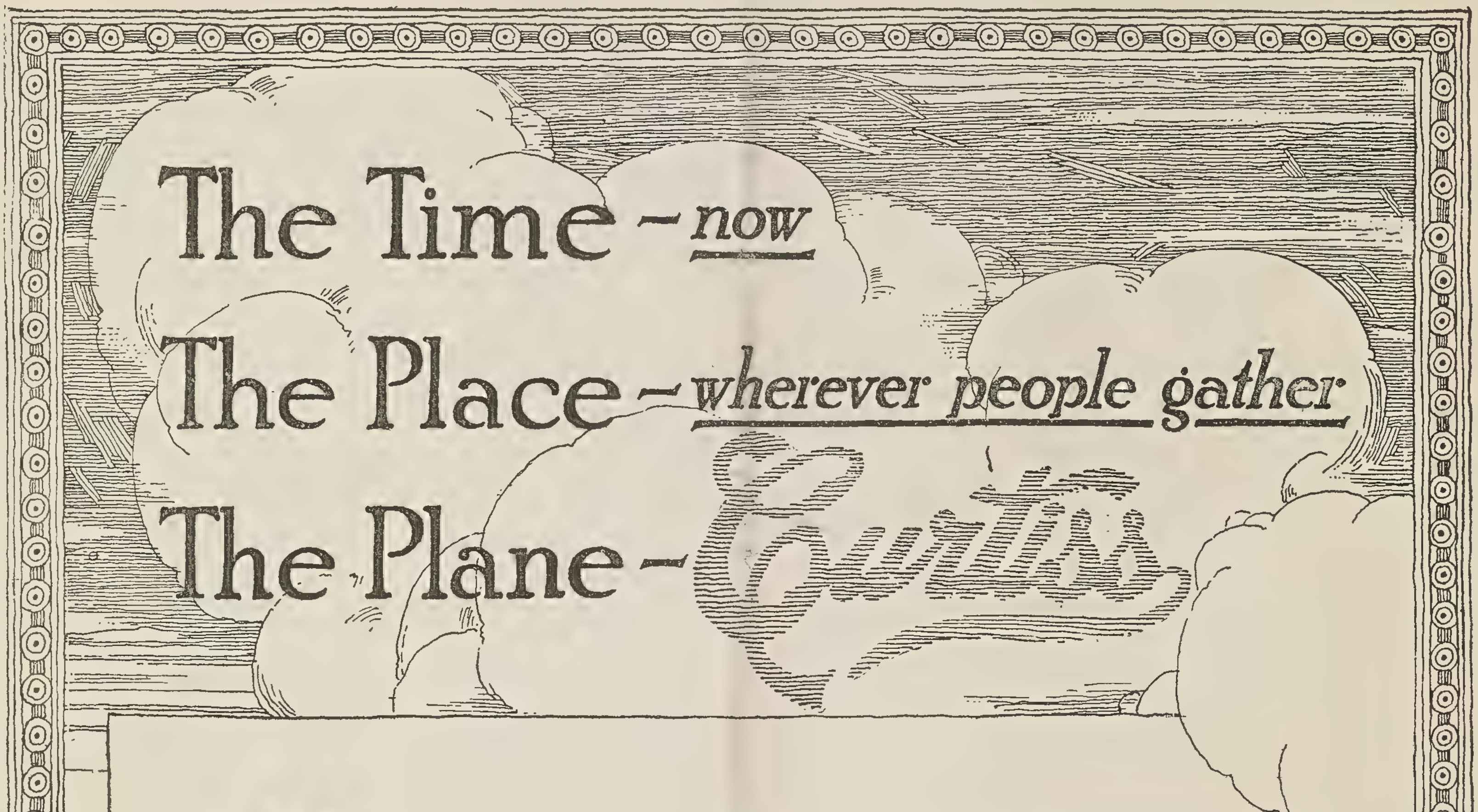
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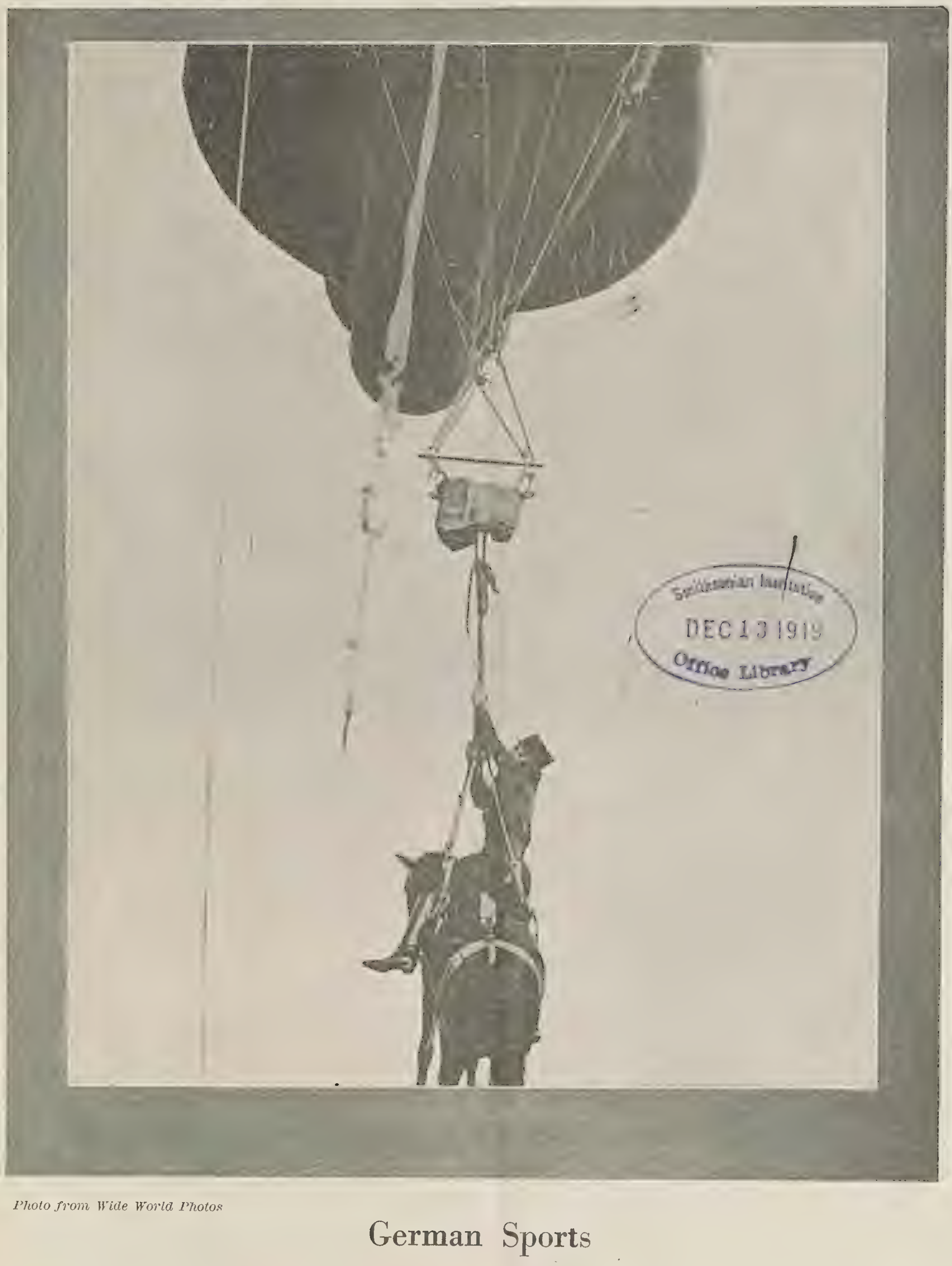

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Photo from Wide World Photos

German Sports

Harry Fiel, a German Motion Picture Actor, Performing a Daring Stunt by Descending on Horseback with a Parachute from an Altitude of 280 Meters, from a Captive Balloon

Owing to the General Strike of the New York Printers This Issue Was Printed in a Rural Newspaper Office

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

The Glenn L. Martin Company
CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

Airplanes and America's Safety

Rear Admiral Fullam, U. S. N., Points Out the Part They Will Play In Our Defense

Radical departures in naval architecture with a possibility that present types of superdreadnaughts and battle cruisers will be driven from the sea, is a problem that soon must be faced by the leading maritime nations of the world, according to Rear Admiral Fullam, U. S. Navy, retired.

The former commander of the Pacific fleet, gives his reasons for the United States to build new battleships to guard long range fire as follows:

'There are five different methods of attack that involve the possible destruction of the immense and costly ships that are now regarded as the measure of sea power.

"1. The plunging fire of modern guns at extreme ranges of 16,000 yards and above.
"2 Attack by bombing from aircraft.
"3. Submarine mines.
"4. Torpedoes fired from destroyers.
"5. Torpedoes fired from torpedoplanes.

Atlantic Fleet Seaplane Division No. 1, Consisting of Six F-5-L Seaplanes, Riding at Anchor Off the Naval Aircraft Factory, Having Just Completed a Trip from Newport, R. I.
The Duties of this Division are Numerous, Besides acting as Eyes for the Fleet, Wrecks and Derelicts are Located and Reported. It was this Fleet that Escorted President Wilson In and Out on His Trips To and From Europe, as well as the English Dirigible, the R-34.

"The decks and upper works of modern ships are completely vulnerable to the plunging fire of big guns as well as to bombing from airplanes.

High Angle Fire

"It must be apparent that a projectile which attains the range of 16,000 yards or more rises in the air, and in consequence of this fact the 'angle of fall'—the angle at which it strikes the horizontal plane at the end of its flight—is so great that we have the practical effect of motar fire. A salvo or broadside of such high explosive shells landing on the unarmored deck will inevitably penetrate to the vitals and cripple or completely destroy the ship.

"Success in the accurate determination of the range will be in some measure assured by observation and report from aircraft hovering over the scene of battle. 'Sea power', or fighting power, in the future will be largely dependent upon control of the air, and the fleet that secures this control in future battles must win, other things being approximately equal.

"In other words, aircraft will not only constitute dangerous offensive weapons in themselves, but they will contribute greatly to the accurate and effective use of a ship's guns in battle. They will be of double value and from present indications airplanes will soon become one of the most invincible elements in sea power.

Aviation's Sudden Development

"The weakness of modern armored ships is found in the fact that the vertical armor belt no longer protects their vitals. At ranges of 16,000 yards or more this belt presents a very small target—a mere vertical ribbon—whereas the horizontal target presented by the deck of a vessel 600 or 700 feet long with a beam of from 70 to 90 feet, now becomes the primary rather than the secondary point of attack, the principal instead of the secondary target.

"In other words, the belt of side armor, and even the turret armor which formerly served as a protection at short or mid ranges is of little use against long range or plunging fire

"The danger to the fleet from bombing attack of airplanes has been more or less discounted by naval officers until quite recently. Developments in air navigation have been very sudden and quite astonishing. It is folly to longer ignore the fact that the successful trans-Atlantic flights and the probable further advance in air navigation have demonstrated beyond question that the greatly increased endurance, range, reliability, speed and carrying capacity of heavier than air machines will soon render them the most dangerous enemy of the enormous $20,000,000 vessels that now constitute the fighting line of a navy.

Air Command Necessary

"In order to bring this matter forcibly and practically before even the lay reader, let us imagine a fleet of modern dreadnaughts operating and cruising at some distance from its base and nearing an enemy's coast. It is evident that it would be quite impossible for such a fleet to carry with it at all times, night and day sufficient number of air and sea planes to insure immunity from air attacks launched from the coast of any first class power acting on the defensive.

"The farther the fleet cruises from its own shores and the nearer it approaches the hostile shore the greater will be the disparity of the air forces in favor of the defending nation. In other words, the attacking fleet must inevitably lose command of the air above it and in this event its position will become untenable and hopeless.

Guns For Fleet Defence

"Let us briefly picture the resulting contest:

"The attacking fleet must proceed in column or line formation. The enemy can easily fix and contstanly report the position of the fleet by means of scout planes. A constant stream of bombing planes can be dispatched from bases on the coast against the fleet, and these planes delivering their fire in succession as they fly over the column can return to their base for more bombs as soon as their supply is exhausted.

"The fleet may be constantly threatened by an unceasing rain of bombs from numberless planes, and the attacking aircraft can, by reason of their great speed and facility of observation, choose methods of attack which will render their fire most effective and best secure their own safety.

"The attacking fleet in such cases can rely alone upon anti-aircraft guns for its defense when it loses control of the air. There are officers, perhaps, who will continue to place reliance upon the defensive fire from the fleet. They will argue that improvements and new inventions in guns will more than keep pace with the offensive devices with which bombing planes can be equipped. But it is believed that this theory will soon prove illusive, and that it will at no distant day be admitted that a fleet with unarmored decks cannot live at sea unless it absolutely controls the air above. Sea power will be subordinate to or dependent upon air power.

"The argument that improved ordnance will destroy bombing planes and thus secure protection for the fleet may be met by the prediction that improved bombs and means of dropping them skillfully and effectively will more than keep pace with improved defensive ordnance. We may predict that a bomb may be produced combining the characteristics of a contact bomb, a depth bomb and a submarine bomb, and that an attacking squadron of aircraft can make circles around a fleet and plant these mines around and ahead of the column or drop them on the decks."

U. S. Development of Commercial Aeronautics

Its Connection with Military and Naval Aviation is Vital and must Proceed

The development of commercial aviation is proceeding rapidly along the following major lines:

1—United States mails.
2—Package and Express.
3—Freight carriage to points now inaccessible or difficult to reach over ordinary systems of transportation.
4—Passenger transportation (a) where speed is the controlling factor; (b) for pleasure.
5—Sporting purposes.
6—Surveying, mapping and photography.
7—Exploration.

The mails offer the most natural means at present for aeronautical development and the successful operation of the Washington-New York, Cleveland-Chicago and Atlanta-Macon-Montgomery experimental routes, gives definite assurance that postal service via the air will soon be extended throughout practically the entire United States, with the promise of extensions to Alaska and the West Indies. The air mail is now carried by the Curtiss, Standard and L-W-F-De Haviland planes, with the trend for the future toward the multiple-motored machine capable of making non-stop runs by night for distances at least the equivalent of the 800 miles from New York to Chicago. The prospect for forty-hour mail service from Hell Gate to the Golden Gate by next spring is said to be encouraging.

Companion commercial service to the construction and operation of mail ships is found in the carriage of package and express matter. One of the internationally known express companies is preparing for such an undertaking. One airplane company is figuring on long-distance movement of securities and bank papers on which interest is drawn and the quick exchange of which is consequently a matter of dollars. Commercial airplanes now under construction provide, in most instances, for the carriage of packages as well as passengers, just as interurban cars divide available space.

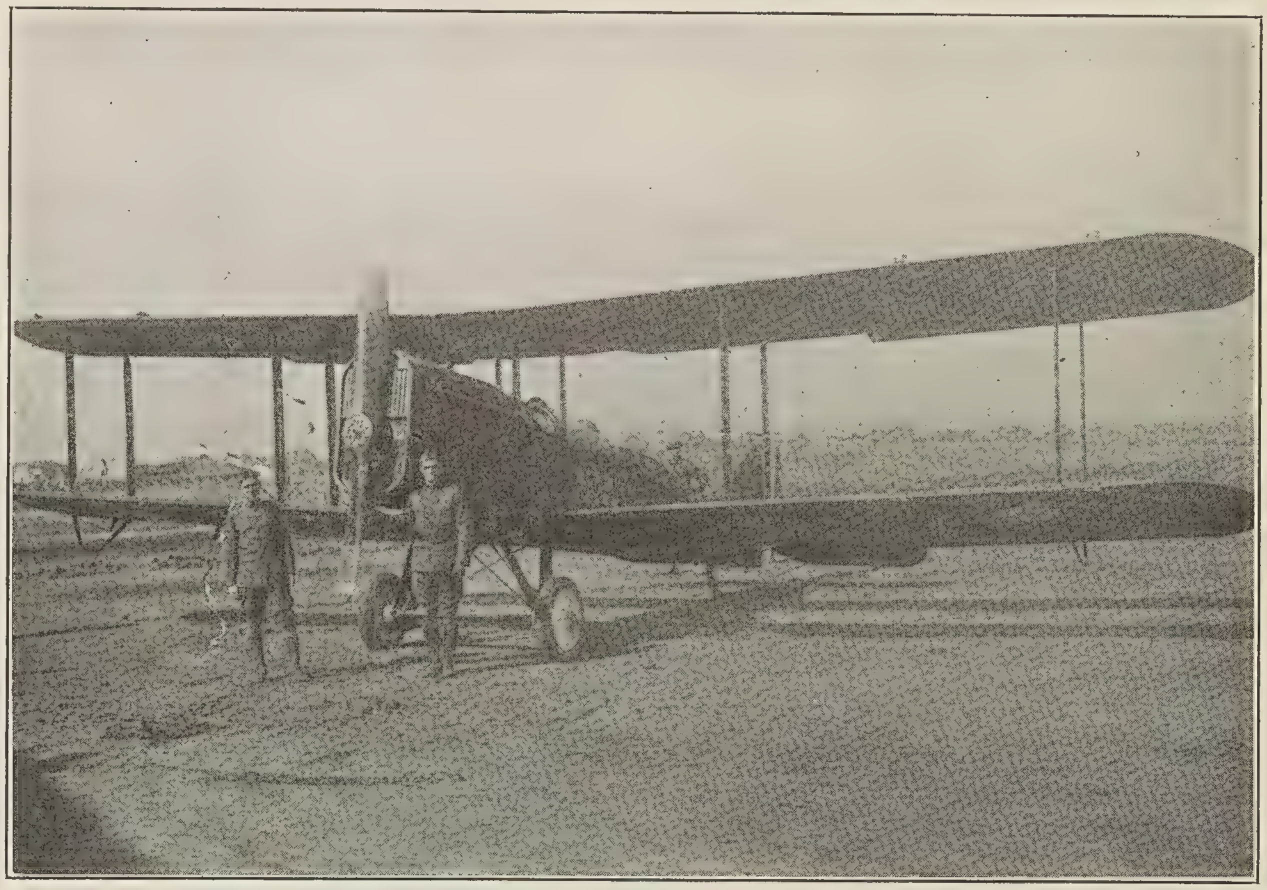
It has been demonstrated that large airplanes have an increased lifting power per square foot. Machines with at least two motors, and capable of carrying upward of two tons, are going into the freight business. A profitable field, it is declared, is being developed, first, where speed is the controlling factor or, second, where existing transportation is unsatisfactory. Thus several American companies are negotiating for service in the western, southwestern or Mexican mining and oil regions, and in the plantation district of Central and South America, accessible up to now only by river boat. If one airplane can not carry as great a load as a boat small enough to navigate some of the shallow South American streams, it can make the trip in hours whereas days are required under the old method.

Passenger carrying depends on the element of safety provided, as has been pointed out by Orville Wright. This factor, in turn, depends largely on public support, expressed in the development of an adequate policy calculated to encourage this newest of American industries and also in the establishment of municipal landing fields. As mechanical development proceeds, machines become more stable and as terminals are provided the danger of forced landings is reduced. Increased patronage from those who desire to move from place to place with great speed or who wish to fly for pleasure thus becomes certain, assuming popular support is found in America as it is in Europe.

The airplane and the hydro-airplane provide the keenest of thrills to the sportsman grown somewhat weary of motor car or motor boat and the development of flying as a sport has already progressed so far as to assure a definite place for aerial events in the "derbies" of the future. Gentlemen's scout planes and hydro-airplanes are now being made to order just as roadsters have been custom-built.

The commercial uses of the flying machine in surveying, mapping, photography and exploration are so obvious that capital has been attracted to legitimate though novel enterprises in which the airplane and the camera or surveyor's instruments combine as working equipment. Bird's eye views are now literally airplane views, taken with accuracy of detail and reproduced absolutely to scale. A surveyor working from above finds his task greatly accelerated and simplified. No map-maker, laboring in the old way, could hope to obtain the wonderful results achieved by observation from the air. This great advantage makes the airplane of inestimable value in exploration, and one of the commanders of Dorr and Carlstrom fields is authority for the statement that during the war, more was actually learned about the Everglades than had been learned through all the years preceding.

The connection between commercial aviation and military and naval aeronautics is vital. The former underlies the latter. It is to the commercial personnel that the War and Navy Departments must look for expansion, when necessary. This is the attitude adopted by Great Britain whose Committee on Civil Aerial Transport, in its report returned recently to Parliament, declared that: "Cost what it may, this country (Great Britain) must lead the world in civil aerial transport."



Aviation Mechanician Charles K. Powell and Lieut. Col. B. F. Castle, A. S., U. S. Military Attache—Taken at the International Aviation Exposition, Amsterdam, Holland—Lieut-Colonel Castle has just resigned from the Air Service.

New Air Mail Record

The Aerial Mail Servce of the Post Office Department recently made a non-stop flight with the mail from Cleveland to Jersey City, a distance of 415 miles, with an alcohol fuel. The distance was covered in 3 hours and 26 minutes, the rate of speed being 120.6 miles per hour. The first 215 miles from Cleveland to Bellefonte was made in 1 hour and 40 minutes, or at a rate of speed of 129 miles per hour.

The purpose of the test was to determine how much more mileage it was possible to get out of alco as compared with high test gasoline. The results obtained are in keeping with the two months' flying on this synthetic fuel between New York and Washington.

This was the longest non-stop flight ever made with an airplane carrying mail. The longest non-stop flights in the mail service heretofore have been the daily flights between Cleveland and Chicago, a distance of 325 miles.

Paul S. Oakes, a regular mail pilot on the Cleveland-Chicago run, was the aviator in this record flight, the plane being a DeHaviland-4, rebuilt by the Post Office Department and powered with a Liberty-400 hp. engine.

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THE WORLD'S AIRPLANES AND SEAPLANES

The Dornier Monoplane Flying Boat and the Strutless Monoplane

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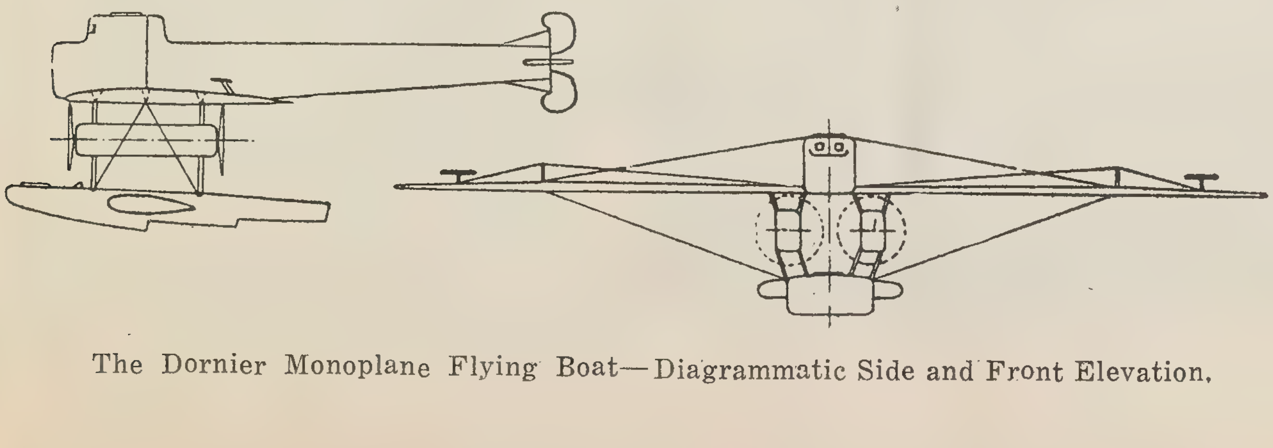
THE (GERMAN) DORNIER "GIANT FLYING BOAT"

In view of the unusual arrangement, a few notes concerning the Dornier monoplane flying boat, which was under construction when the Armistice was signed may not be without interest. The machine was built by the Zeppelin Works at Lindau on Lake Constance and was designed by the chief designer of that firm, Herr Dornier, who is Swiss by birth. As the accompanying diagrams show, the machine is a monoplane, and is, in a sense, like a flying boat seaplane. An idea of the size of the machine may be formed when it is pointed out that the wing span is 36 m. (118 ft.). The power plant consists of four Maybach motors, each 260 hp., driving two tractors and two pushers.

The fuselage is placed above the wings, and in it are housed gunners and other crew. The pilots are seated down in the boat, or central float, which also accommodates gunners, one in the nose and one in the stern. In the boat, between the pilots and rear gunner, are placed the petrol tanks, which have a capacity sufficient for a ten hour's flight. The machine carries a crew of nine, which may be constituted as follows: Two pilots, two gunners in the "hump" on top of the fuselage, one wireless operator in the nose of the fuselage, two gunners in the boat, and two engineers. With full load the machine has attained a speed of 145 km.-hour (about 90 m.p.h.). One of the finest flights made by the Dornier was a non-stop trip from Lake Constance to Norderney, the Naval Air Station in the North Sea.

With regard to construction, it should be pointed out that there is no wood in the machine, the wings, fuselage, boat and engine mountings being made of duraluminum. The Zeppelin firm have also during the war constructed all-duraluminum single seaters of the twin-float type.



The Dornier Monoplane Flying Boat—Diagrammatic Side and Front Elevation.

Group 2. No. 8 **The U.S. D9A**

The U. S. D9A is a two-seater tractor biplane. It was designed, developed and produced by the Airplane Engineering Division at McCook Field. Its speed, manoeuvrability, and comparatively large carrying capacity make it well adapted for a day or night bomber, or for a reconnaissance or utility plane. It is equipped with a Liberty 12 engine, which harmonizes thoroughly with the general design. Probably the most interesting feature of the machine is the standarization, every detail being entirely suitable for quantity production by American methods.

POWER PLANT

Liberty 12 cylinder " V " type.	
400 hp. at 1200 r.p.m.	
Weight dry, 825 lbs.	
Capacity of main fuel tank	134 gal.
Capacity of gravity fuel tank	8 gal.
Capacity of oil tank	12 gal.
Water carried	125 lb.

MAIN DIMENSIONS

Span	45 ft. 11 in.
Overall length	30 ft. 2⅞ in.
Overall height	10 ft. 6 in.
Stagger	12½ in.
Gap	6 ft. 1½ in.
Dihedral	30 (both planes)
Area of upper plane	251 sq. ft.
Area of lower plane	239 sq. ft.
Area of stabilizer	39.1 sq. ft.
Area of elevator	23.6 sq. ft.
Area of vertical fin	5.2 sq. ft.
Area of rudder	13.5 sq. ft.
Area of ailerons (18.07 sq. ft. each)	72.28 sq. ft.

MAIN WEIGHTS

Weight with full load—reconnaissance	4521 lbs.
Weight with full load—day-bomber	4987 lbs.
Weight with full load—night-bomber	5000 lbs.
Weight of fuselage complete	340 lbs.
Weight of upper plane	257.5 lbs.
Weight of lower plane	240 lbs.
Weight of landing gear	149 lbs.

PERFORMANCE

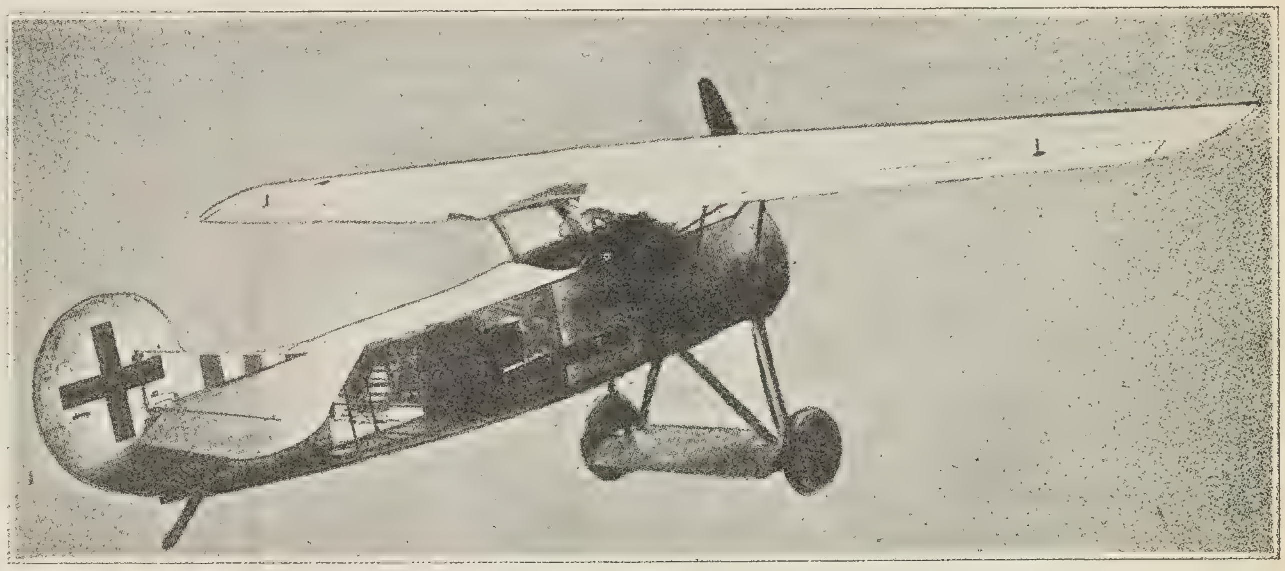
	Reconnaissance.		*Day and Night Bomber.*	
Altitude.	*Speed.*	*Time.*	*Speed.*	*Time.*
Ground	124 m.p.h.	......	121.5 m.p.h.	
6500	120 m.p.h.	9 m. 15 s.	118 m.p.h.	13 m.
10,000	116 m.p.h.	16 m. 40 s.	114 m.p.h.	22 m. 30 s.
15,000	106 m.p.h.	......	......	......

Landing speed, 62 m.p.h.
Stalling speed, 58 m.p.h.
Absolute ceiling, 20,000 ft.
Service ceiling, 17,000 ft.
Endurance at 6500 ft = 3½ to 4 hrs. = 420 to 480 miles. sea.

STRUCTURAL FEATURES

The most interesting structural feature is the unique manner in which the design lends itself to standarization. The fuselage is made up of two sections, the front being veneer, rigidly braced by four longerons and the usual struts, while the rear part is in conventional design braced with wire, and is covered with cloth. The wings are of sturdy wooden construction and the interplane struts are steel. The empennage is of the standard wooden construction and the stabilizer is adjustable between 0° 50′ and 3° 40′, the normal position being 2° 15′. Dual control is installed, the gunner's stick being removable. A booster radiator, controlled from the pilot's cockpit, is used in connection with the nose radiator. In this manner, any desired water temperature can be maintained.

The armament consists of a fixed Browning gun, synchronized with the propeller and operated by the pilot, and twin Lewis guns on a scarff ring mount in the rear cockpit. Provision is made on the machine for carrying various bomb loads up to 550 lbs. It is provided with complete night flying and bombing equipment. All exposed parts are carefully streamlined such as the landing gear shock absorbers, aileron cable pulleys, etc. by means of light sheet aluminum covers. The equipment includes oxygen apparatus, electrical heating arrangements, and combined wireless and interplane set.



FOKKER MONOPLANE E-5.

A STRUTLESS MONOPLANE.

In the appended photograph is shown a strustless monoplane, the Fokker E.5, a very interesting development of the Fokker wireless biplane.

The main characteristics of the machine are:

Gross load 1,235 lbs.
Weight, empty, 795 lbs.
Useful load 440 lbs.
Span 28.2 ft.
Length 18.8 ft.
Height, 8.35 ft.
Power Plant, Oberwirel 110 H. P. 9 Cylinder Rotary.

The wing is very thick at the center, having a maximum of .83 feet, and tapering down toward the tips.

The assembly of the machine is very smple. The fuselage is in steel tubing. Landing gear is provided with a type spring shock absorber.

Notes on Technical Aeronautics

Substitution of Alloy Steel for Soft Steel

A study has recently been made of the possible saving in a tractor biplane of standard type of about 3800 lbs. gross weight by the substitution of alloy steel for soft steel for the fittings, on the basis of the two following specifications:

MEDIUM CARBON STEEL

Tensile strength, 60,000 lbs./sq.in.
Yield Point, 36,000 lbs./sq.in.
Elongation, 22%.

ALLOY STEEL

Tensile Strength, 100,000 lbs./sq.in.
Yield Point, 75,000 lbs./sq.in.
Elongation, 15%.

Every fitting on the machine was examined critically, and a careful practical decision made at each point to see whether the substitution could be made from a shop working point of view; a redesign was made and weights carefully estimated.

It was found that all pin holes could be reduced, as also sizes of lugs.

Although a veneer sided fuselage was under consideration with a minimum amount of steel, the estimated weight saving was from 19.67 lbs. to 11.0 lbs., giving a saving in weight of about 8½ lbs.

For an average machine of this size, the probable weight of fittings including chassis fittings is about 30 lbs. The use of alloy steel would represent a saving of some 10 or 15 lbs.

In deciding whether the substitution of alloy steel is worth while, the designer can safely base his judgment on the above figures as one of the considerations involved.

Moisture Absorption Through Varnish Same for Different Species of Wood

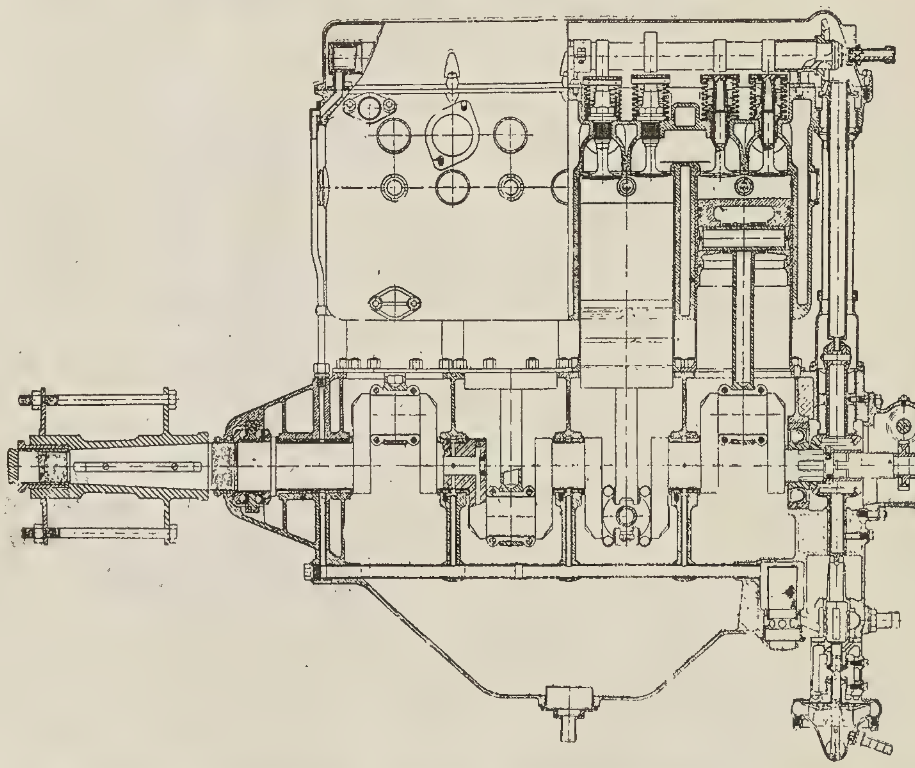
In experiments made by the Forest Products Laboratory, it was found that varnishes do not entirely prevent the transmission of moisture into wood but merely retard it, and that apparently there is no difference in moisture absorption through the coating due to the species of wood used.

The panels used in the experiments were of yellow birch, basswood, red gum, African mahogany, white ash, white pine, Sitka spruce, southern yellow pine, bald cypress, incense cedar, white oak, western yellow pine, Port Orford cedar, and sugar pine.

Three coats of high-grade spar varnish were applied to 4 panels of each species. Two panels of each species were brush-coated and 2 were dipped by a special dipping machine designed to secure an even coating. The panels were allowed to dry 72 hours between coats and 10 days after the final coat before they were given the moisture-resistance test.

The moisture-resistance test consisted in exposing the panels for 17 days to a humidity of 95-100 per cent, or in an atmosphere practically saturated with moisture.

At the end of this test it was found that all the brush-coated panels had absorbed between 5 and 6.5 grams of moisture per square foot of surface, and the dipped panels between 4 and 5 grams.



Section of Hispano-Suiza Engine Showing the Application of Ball Bearings to Crankshaft and Simplicity of Valve Operation

Such variations in amount of absorption as appeared could easily have been due to inequalities in the application of the varnish. It was quite noticeable that the dipping process produced a more moisture-resistant coating than brushing.

COATING THAT PREVENTS END CHECKING

Wood, whether in the form of logs,lumber, timber shaped blanks, or veneer will split and check at the ends during seasoning, if drying is allowed to go on at a natural rate through the end grain. To retard the rate of drying from the ends, it is necessary to cover them with some protective coating.

The law of end coatings, in simple terms, is that the harder nad greener the wood, the more effective must be the coating. In its experiments to determine the practicality of various coatings and end dips, the Forest Products Laboratory found the following to be true:

Paint is convenient to handle, but is of low effectiveness.

White lead is convenient to handle, and i of medium effectiveness.

Lorac, a commercial compound, is convenient to handle and is of considerable effectiveness.

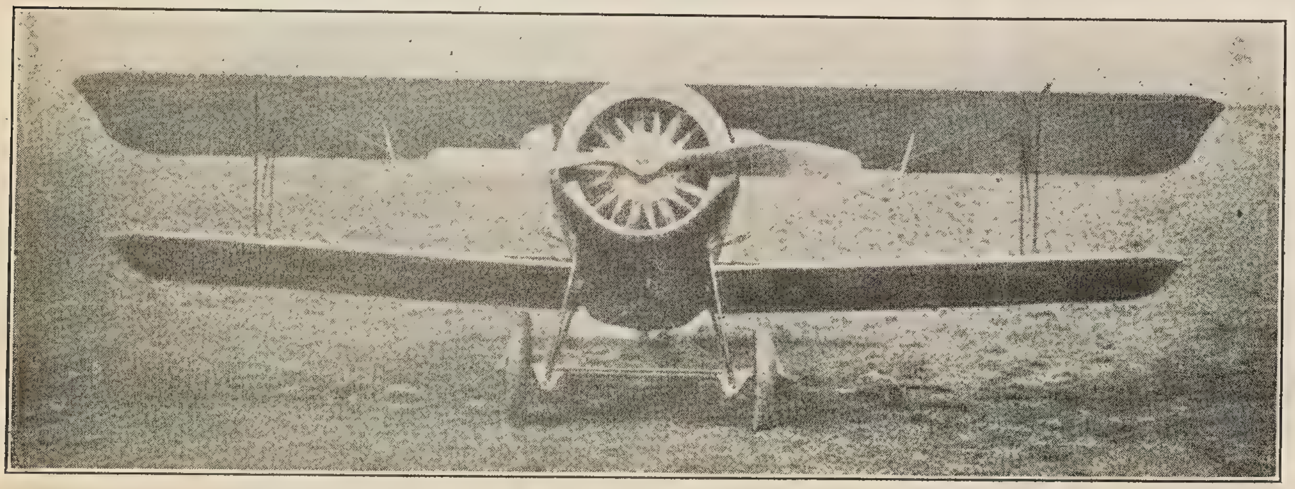
Rosin-lampblack is inconvenient to handle but is of high effectiveness.

Rosin-lampblack is made according to the following formula:

Clear grade rosin, 60 parts by weight
Lampblack, 1 part by weight

The rosin should be melted but not allowed to boil or froth. The lampblack should then be thoroughly stirred in, the ends of the stick should be dipped in this molten mixture to a distance of about ½ inch. When hard, the coating should be smooth, free from bubbles, shiny, and an eighth of an inch thick over the end.

If the stock is to be subjected to rough handling which might cause the coating to chip when cool, linseed oil may be added in the proportion of 1 to 15 by weight, but this will have a tendency to make the coating excessively soft in the kiln at temperatures above 130 degrees F.—(Forest Products Laboratory).



New Sporting Machine——80 hp. LeRhone Engine

GREIFF WITH BOSCH

Victor Greiff, Lieut. U. S. N. R. F., after two years service with the U. S. Navy, Bureau of Steam Engineering, including service as radio officer on the lost cruiser, San Diego, and subsequently in radio development work, has assumed duties as research engineer for the American Bosch Corporation of Springfield, Mass.

Mr. Greiff was formerly connected with the Covic Electrical Company, in an executive capacity Previous to his employ there, he was with the New York Edison Company and the General Electric Company. For four years he was instructor of the extension classes at Columbia University, from which college he graduated in 1907 with a degree of Electrical Engineer.

Trade Review

Aero Ltd. Buys Ships

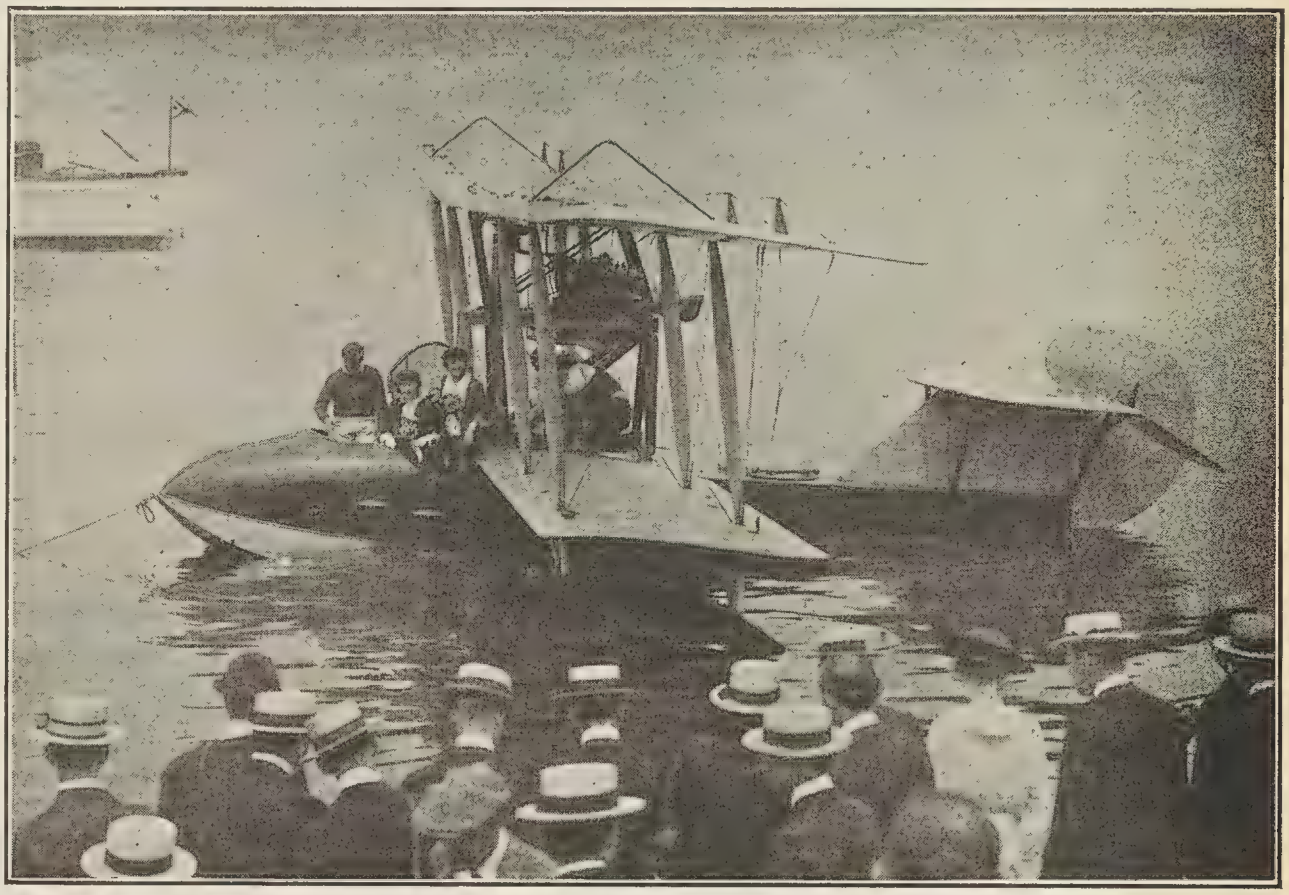
With the opening of sealed bids in Washington for the private purchase of 185 Navy Department seaplanes, it was learned that the Aero Limited, Inc., which now has in operation the New York—Atlantic City and "Round N. Y. Sightseeing" air passenger carrying services will probably become the leading factor in commercial aviation in the United States within a short time. The Bureau of Supplies, Navy Dept., announced that Aero Ltd. Inc., had been the successful bidder for five new flying boats each having a carrying capacity of four passengers and equipped with wireless telegraph and telephone at a price of $6,165 each. These seaplanes are equipped with 330 hp. Liberty engines, have never been flown except to pass tests, and have an appraised valuation of $18,480 each. Incidentally this bid was the highest submitted per boat. according to Howard C. Darrin, treasurer of Aero Ltd., who was in Washington negotiating the purchase.

Aero Ltd. Inc. also entered bids for five additional boats of similar type at $4,000 apiece and ten Aeromarine 175 hp. hydroplanes at $1,600 each, the latter suitable for two-passenger ships.

In a statement regarding the purchase, C. Nicholas Reinhard, general passenger agent of the Aero Ltd. said:

"The five 4-passenger Liberty seaplanes that we successfully bid for, will be immediately placed in service out of the port of New York two being added to our daily New York—Atlantic City service and the others to the hourly "Round New York Sightseeing" service, which has proven remarkably successful since its inauguration. These new types of flying boats can be converted in a few days from machines of war to luxurious pleasure planes. The cabins are sufficiently roomy to accommodate four passengers comfortably in reclining Pullman chairs and in addition to the wireless phone instruments for passengers' use we will also install small card or lunch tables for their diversion or utility. The other planes that we expect will be sold to our organization will be similarly reconstructed.

"Plans are already under way for the transfer of our fleet to the South when the weather around this port becomes too cold for comfortable passenger flying .The first section of our fleet, consisting of three 4-passenger planes, will leave New York November 15 and arrive in Palm Beach their destination three days later. Twelve passengers will be carried by the trio of planes, and the fare will be computed at the regular flying rate of $1 per mile per person. Applications for reservations on this initial New York-Palm Beach air service have already been received from two prominent society matrons. According to our prsent plans, there will be sailings of three planes in formation every Saturday thereafter until our entire fleet is in operation in Florida.



One of the Flying Boats Operated by the Aero (Limited) Travelers' Co.
(c) *Underwood & Underwood*

BLAIR IN MICHIGAN

Lieut. William M. Blair, formerly of the United States Navy Air Service, is now manager of the Thompson Airplane Company of 493 Woodward avenue, Detroit. In some 600 hours of flying Blair never had a crash.

Lieut. Blair accepted the position with the Thompson Airplane Company primarily because he saw great possibilities for the commercial and sporting use of the airplane and flying boat in Michigan and northern Ohio, the district for which the Detroit concern is Curtiss distributor. He was particularly impressed with the fine opening presented there for flying boats. The results of the first few months of his regime have more than justified his prediction that the Wolverine State is destined to be among the leaders in things aerial.

Not long ago Lieut. Blair brought a flying boat from New York to Detroit under her own power. Leaving Port Washington in a Curtiss Seagull early one Sunday morning, Lieut. Blair arrived at Detroit the following Tuesday afternoon. His actual flying time was about 13½ hours.

The Seagull behaved beautifully all the way, Lieut. Blair reported, and really did many things that never were expected of her. Since arriving in Detroit she has made several trips to near-by points in the Thompson Airplane Company's territory, and always has given fine satisfaction.

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A Superfluous Navy

IN a characteristic way, C. G. Grey, the emphatic—and this is the word we mean—editor of the AEROPLANE, speaks in heretical terms of the superfluous British Navy. Making due allowance for emphasis, and perhaps for exaggeration, Mr. Grey's remarks have considerable interest for the designers and constructors of aircraft.

Thus the torpedo carrying plane seems to be worthy of constantly increasing attention. In a recent manouever a squadron of torpedo droppers theoretically annihilated a British squadron.

The torpedo carrier can outrange any big gun, and operate under conditions of visibility, which render long range guns utterly useless for the time being.

For land action, a number of naval failures during the war seem again to strengthen the case for the torpedo-carrier.

Apart from presenting strongly the case for the naval airplane, one brilliant suggestion of Mr. Pemberton Billing's is recalled. The idea is to build a special type of flying boat with the engine in the hull, and the wing-structure to fold down and inwards so that the whole machine could be packed into a box very little bigger than the hull of the boat. This machine was to be carried in a water-tight compartment built onto the hull of a submarine. The machine was packed in its compartment all ready for flying, loaded with gasoline and bombs. The submarine emerged. The lid was taken off the box. The aviator took his seat and wound a handle which pulled up all the wing structure into position. The submarine then submerged leaving him floating. He then was ready for action.

Mr. Grey and Mr. Billing may not always be solidly conservative, but they provide stimulus for reflection!

Analysis of Radiator Problems

IN a recent report of the National Advisory Committee Dr. H. C. Dickinson and his collaborators give a general analysis of the airplane radiator problem.

Nothing is indicated so clearly by this report as the complexity of the subject.

Discussing, for instance, the question of the horse-power absorbed "chargeable to the radiator," a good many more factors must be taken into account, other than the mere resistance of the radiator core as measured in the tunnel. There is the power absorbed due to the weight of the radiator, the head resistance of the core, increase in the resistance of the fuselage or other parts of the plane caused by radiator interference, and the power necessary to produce water flow through the radiator.

When a designer considers the question of replacing a nose radiator to a free radiator he has all these factors to compute and none of them is easy of computation.

Besides the question of horse-power absorbed by the radiator, it is necessary to consider the heat dissipated by the radiator and the so called figure of merit. Into this enter the question of velocity of water flow, the temperature differences at inlet and outlet and a number of other factors.

Radiator design is all the more interesting because of this complexity, and from a number of other reports it is gratifying to see Dr. Dickinson approaching the problems in so thorough and scientific a manner.

Veneer Fuselages under Action of Oil

AMONG the difficulties feared in connection with the employment of veneer fuselages, much anxiety has been felt regarding the effect of gasoline, engine and castor oils on the engine bed.

Some recent tests of the Forest Products Laboratory are very reassuring in this respect. Shear tests on plywood glue joints in shear after soaking in oils showed a gradual loss of strength up to 20 weeks. Blood albumen, vegetable, animal and casein glues were used. The losses found at the end of this period were less, however, than soaking or boiling in water for ten days or eight hours respectively.

It is unlikely that veneer engine beds in actual service would ever be subjected to anything as severe as this, and the results would seem to be fairly reassuring.

Thin Plywood as Wing Covering

THE Forests Products Laboratory suggests thin plywood as a material having many possible applications.

The new product is made of two or three tissue-like sheets of veneer, and is extremely light, strong and flexible. It shrinks and swells very little with changes of moisture and will withstand long continued soaking in hot or cold water. Cloth, paper or wire screen may be combined with the veneer to increase toughness and resistance to tearing.

A new method of gluing has been developed for the very thin plywood. The glue is spread on sheets of tissue paper, which when dry are inserted between the sheets of veneer, and a joint is made in a hot press.

A number of tests indicate that the thin plywood for a weight about four times as great per square foot as airplane linen, can be made to give three or four times as great a tensile strength.

Since the plywood is too thin to be considered a structural member under any circumstances, the factor of safety of the ordinary airplane linen is ample, and the airplane can never have its component parts too light; the weight and strength of thin plywood if used as a wing covering is excessive. It also remains to be seen whether satisfactory methods of attachment are readily available.

But when we consider the many difficulties now present in wing covering the troubles involved in correct doping, getting the right tautness and so forth, the fairly rapid deterioration of linen covering, there is no doubt that the aeronautical engineer will at least give some thought to the possibility of substituting the plywood for linen covering.

Transcontinental Race Official Figures

OFFICIAL figures of the result in the Army Transcontinental Reliability Test will be printed in AIRCRAFT JOURNAL of November 8. These reports are based on returns from starting and finishing fields and of the control stations, and will furnish a topic of conversation in aeronautical circles for a long time to come.

Next week's issue will be largely devoted to the report of the War Department Board concerning aviation.

Aircraft Regulations

The Director of Air Service issues the following:

I. 1. Flights in aircraft under the control of the Air Service are authorized for all training or war purposes and such other purposes as are set forth below:

(a) For the proper execution of any approved project of the Air Service or of the Air Service in cooperation with any other branch of the service or department of the Government—special approval of this office to be secured in each case.

(b) For the demonstration of aircraft and aircraft development to officers of the Executive, Legislative and Judicial branches of the Government.

(c) For the rapid transportation of military or civilian officials of the Government, of messages or parcels in cases of urgent necessity and for the convenience of the Government.

(d) For the assistance of stranded civilian aviators or where it is necessary for the saving of human life.

2. The following may be carried as passengers in aircraft under the control of the Air Service:

(a) Any person necessary to be carried as a passenger to accomplish the purpose of any of the flights authorized in Paragraph No. 1, above.

(b) Officers and enlisted men of the Army, Navy and Marine Corps, both active and reserve.

(c) Officers and enlisted men of foreign armies, as a courtesy when they are visiting the United States.

3. No person will be permitted to pilot aircraft under the control of the Air Service except regularly authorized Air Service pilots or bona fide student-pilots of the Air Service.

II. 1. Persons operating aircraft who are not in the military service or who are not under the jurisdiction of the Air Service, will be permitted to use government facilities at Air Service stations contingent upon their proper observance of the air and ground rules in force at the particular station in question, and subject to the discretion of the Commanding Officer thereof as not interfering with the proper conduct of official business of his station, as follows:

(a) They may be permitted to land and take-off from flying fields.

(b) They may be permitted to place airplanes in government hangars over night or for a short time pending repairs.

2. The sale of gasoline, oil, spare parts, etc., or the furnishing of the labor of Air Service mechanics in any form to pilots not in the military service is forbidden.

MAGNETO IGNITION.

In a booklet, issued by the Magneto Manufacturers on "Why Magneto Igniton Makes a Good Engine Better," advantage of magneto ignition over battery ignition is claimed. The magneto manufacturers referred to are the American Bosch Magneto Corp., Ericsson Mfg. Co., The Eisemann Magneto Co., The Simms Magneto Co., and the Splitdorf Electrical Company. Their view of the situation is as follows:

> Many people confuse the generator of a battery system with a magneto. A magneto is the only dependable, self-contained unit that generates high-tension ignition current and delivers it to the spark plugs, without any help from, or connection with a battery or coil.
>
> There are two kinds of ignition systems, magneto and battery. It is the duty of the ignition system to cause a spark at precisely the right moment so as to explode the gas mixture and so produce the power.
>
> Many motors use a battery system because the installation cost is slightly lower, but this is surely not the best policy where absolute dependability is demanded. Owing to the complexity of the battery system, it is easy to get out of order and hard to care for. It often takes an expert to locate a short circuit or poor connection. Attachments are often supplied to prevent some of the several troubles of the battery system,—for instance, a device to prevent leaving the current on while the engine is not running; or a device to reverse the current from time to time to prevent pitting of contact points. While these devices add to the durability and dependability of the system, they add to the complexity and make it difficult for a novice to locate trouble if such should occur.
>
> The magneto system, on the other hand, is more durable and dependable under any conditions of operation. Any trouble can be immediately located and remedied. As long as the magneto is oiled once in a while, there is nothing to go out of order excepting leaky wires or poor connections and these can always be detected. No current can be wasted when the engine is not running so the ignition switch can be forgotten, and since the magneto current reverses automatically, there is no pitting of contact points.
>
> Official tests made during the war on ignition equipment for army aviation, proved that the magneto spark contains from three to four times as much heat as the battery ignition spark. It is this long, hot, fat spark which fires every bit of gas in each cylinder, thus producing the efficiency, characteristic of the magneto equipped motor.
>
> Since the battery spark is thinner and weaker, it does not produce complete ignition as quickly as the magneto spark and it does not enable the engine to develop its maximum power through the wide range of mixtures due to fluctuating engine speeds.
>
> The hot, fat magneto spark affords complete combustion which greatly reduces the accumulation of carbon in the cylinder. Because of the greater heat of this spark it will ignite a heavier mixture without apparent loss of power and so reduces fuel consumption to a minimum.
>
> At low temperatures the battery efficiency is reduced almost one-half and only a thin, weak, spark is produced in the cylinder. The magneto on the other hand gives a strong, hot spark regardless of weather conditions or cranking speeds. A battery spark also requires a more nearly perfect mixture in order that the weaker spark may fire properly. This means careful carburetor adjustments. Then too, as the speed of the engine increases, the spark not only becomes weaker but occurs later—thus causing over-heating and loss of power. The magneto spark will fire a lean or rich mixture, where battery equipped motors are apt to misfire.
>
> Very nearly all records of endurance and performance were made by magneto equipped motors. All types of airplane engines that were used in the World War, with the Liberty as the outstanding exception, were magneto equipped.
>
> Major R. W. Scroeder's altitude record of 29,200 feet was made with a Hispano-Suiza engine which was magneto equipped. The first non-stop transatlantic flight of 1920 miles was made by Capt. Alcock and Lt. Brown in sixteen hours and twelve minutes. Their Rolls-Royce motors, as well as the Sunbeam motors of the R-34, the first dirigible to cross the Atlantic, were magneto equipped.
>
> The fastest time ever made in an automobile—over 149 miles per hour, by Ralph De Palma; the world's one-mile motorcycle records, 35 seconds flat; the world's 200 mile records; first, second, and third places in the 500 miles race at Indianapolis, were all made by magneto equipped motors.

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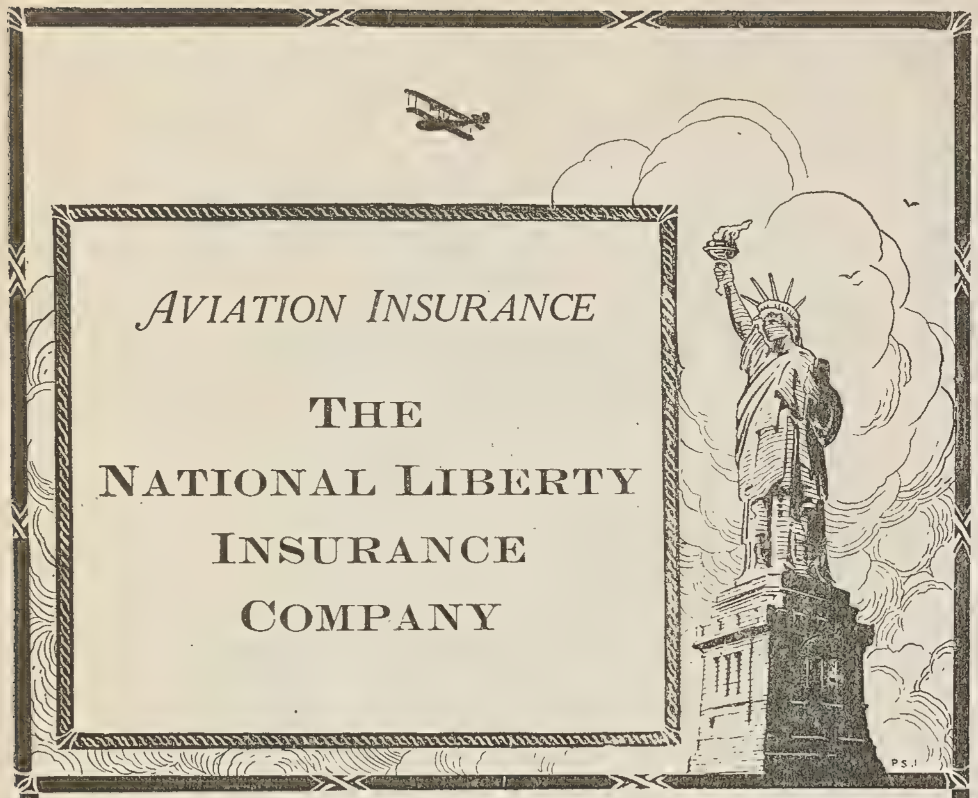

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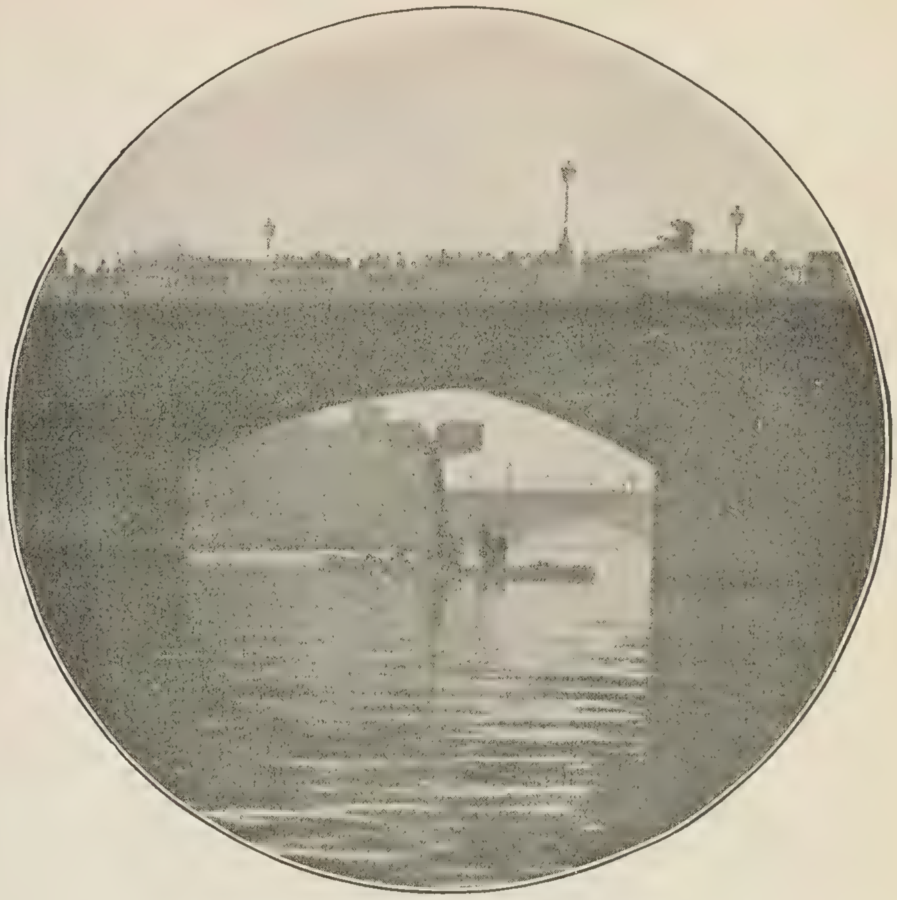

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M. I. T. Endowment Fund

Dormitory of the Massachusetts Institute of Technology with the President's House in the Foreground.

$1,500,000 has already been pledged to the Massachusetts Institute of Technology Endowment Fund campaign. This fact was announced by Dr. Richard C. Maclaurin, president of the Institute, at a meeting held at the New York Technology Club last week. Coleman du Pont, '84, president of the Alumni Association, was in charge of the meeting. A well-knit organization was effected, and class and fraternity teams and other combinations of the 1,100 New York alumni are already at work canvassing for the campaign.

"Mysterious Mr. Smith" will give the Massachusetts Institute the $4,000,000 which he has promised, provided $3,000,000 is subscribed by alumni and friends before the first of the year. However, if these subscriptions total $4,000,000, "Mr. Smith" has consented to satisfy Technology's curiosity by revealing his real name. Henry Clay Frick, J. P. Morgan, John D. Rockefeller, J. M. Longyear, George Eastman, the Guggenheim family, and Henry Ford are among popular guesses as to "Mr. Smith's" identity. He is not a Technology graduate.

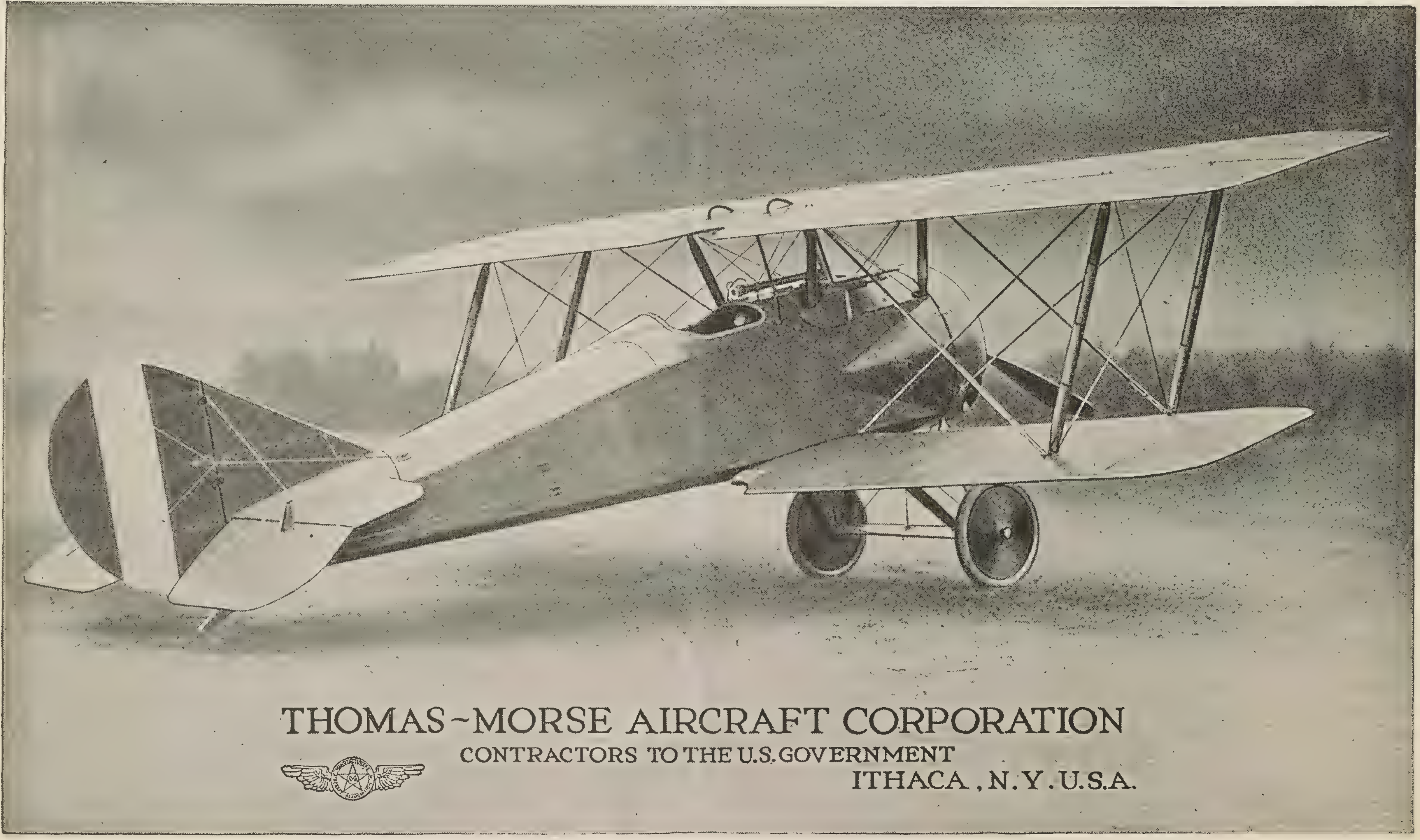
Regularly announced gifts from the Endowment Committee include $500,000 from Coleman du Pont and $200,000 from Charles Hayden.

Dr. Richard C. Maclaurin, president of the Institute, and Coleman du Pont, president of the M. I. T. Alumni Association, made a comprehensive tour in the interests of the campaign, Oct. 14th to 26th. They attended meetings of Technology Clubs in all the large cities as far west as Minneapolis and St. Louis, organizing the "Tech" men for the campaign. They found enthusiasm and optimism everywhere.

There are 3,001 students at M. I. T. this fall. The average attendance before the war was 2,000. Technology's facilities will accommodate 2,000 easily and 2,500 if crowded, but 3,000 overtaxes the Institute's capacity. This eager student demand for a "Tech" education is one of the fundamental arguments in favor of the Endowment Fund.

Overseas students at Technology are more numerous than ever before, there being 150 in the new group. There are notable increases in students from Russia, Norway, and Spain. England, Denmark, Greece, and Turkey are also well represented, as are South America and the Orient. Technology has a larger proportion of foreign students than any other American institution of collegiate grade. These foreign students go home to positions of industrial and commercial influence where they will naturally promote friendly trade relations with America. Technology's influence is widespread.

In view of the fact that Massachusetts "Tech" has only five hundred graduates over fifty years of age and only a very few who can be classed as millionaires, the slogan of the campaign, "Give or get $1,000" is significant. Every "Tech" man is expected to give whatever he can, but those who cannot give much will be urged to get.



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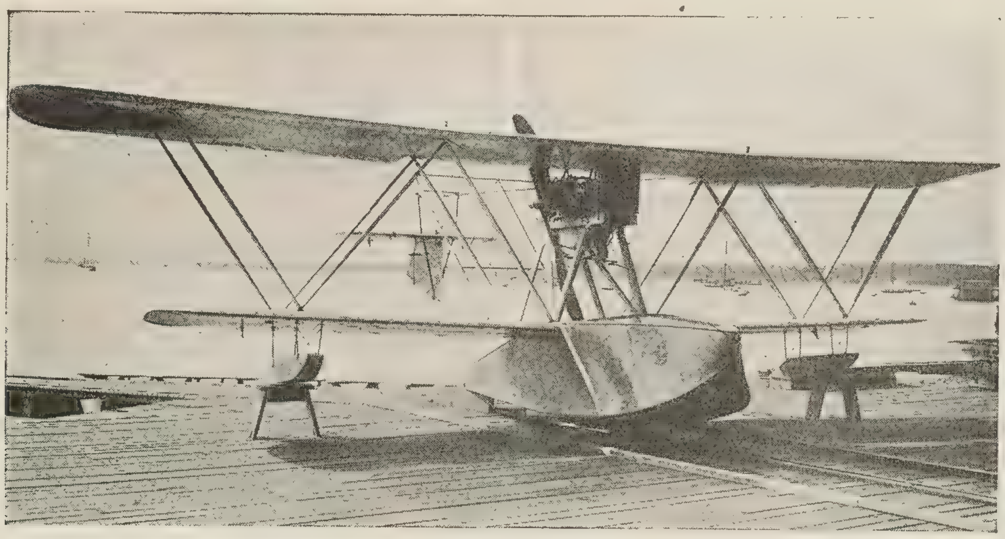

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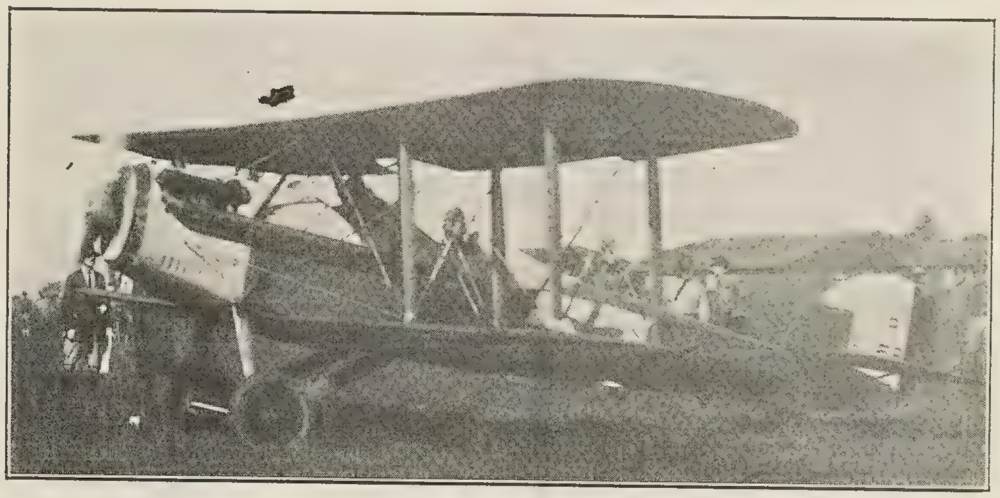

¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

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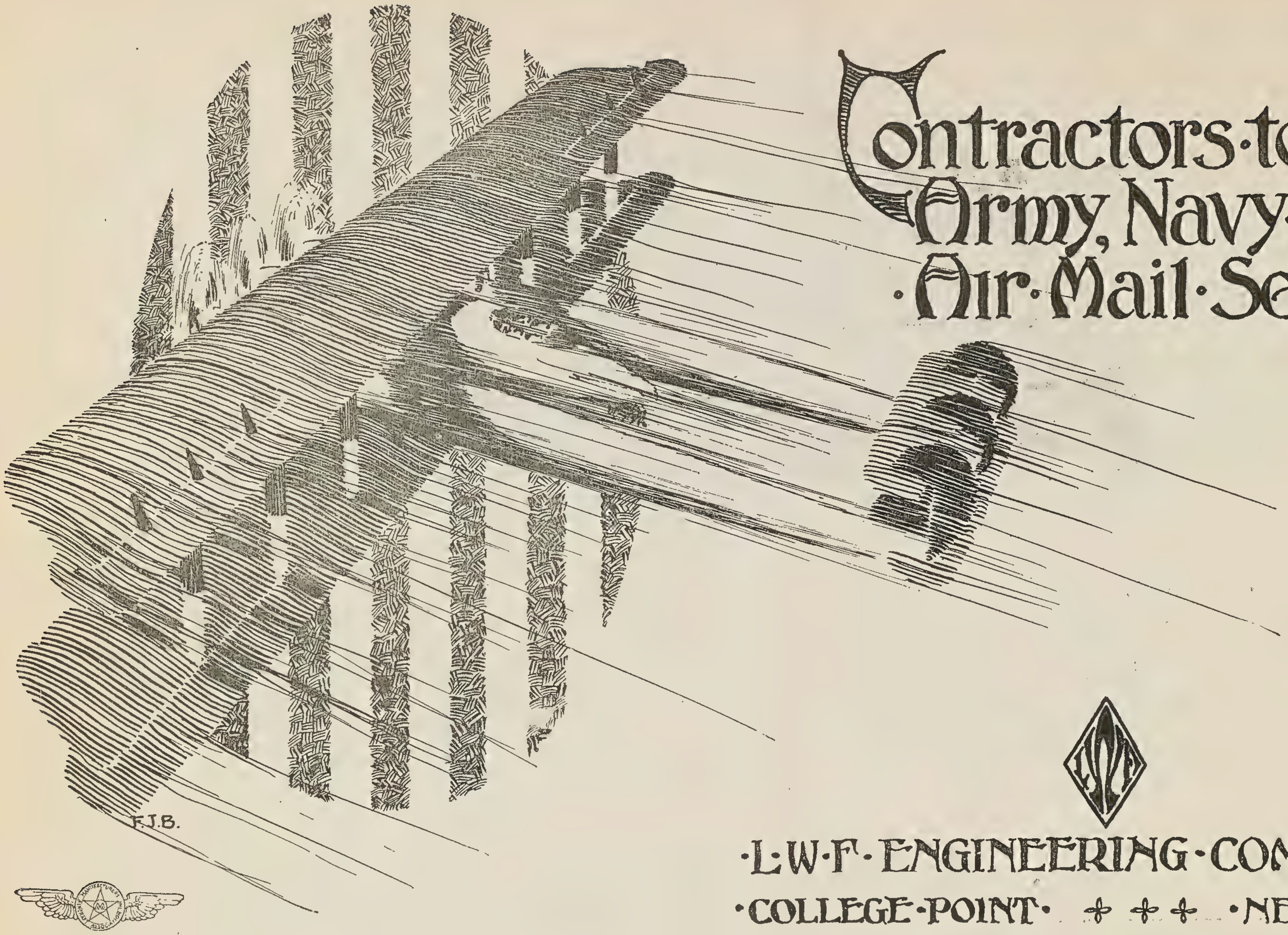

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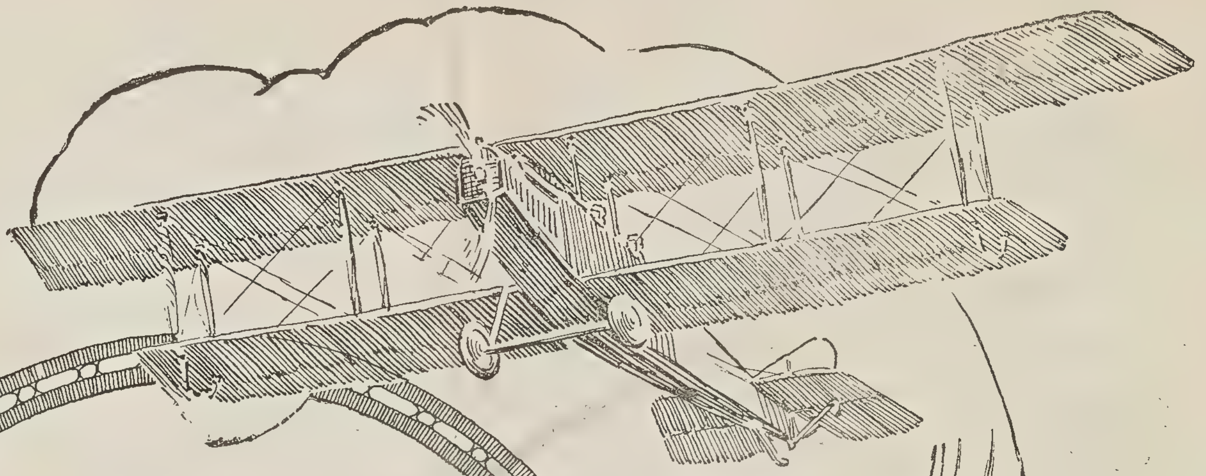

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V #18

AIRCRAFT JOURNAL

November 1, 1919 *Every Saturday* *Price Ten Cents*

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Photo from Wide World Photos

Crossing the Alps by Airplane

The Rear Plane of a British Air Squadron Crossing the Italian Alps, the Entire Squadron Making the Flight in Safety Above the Highest Peaks

Owing to the General Strike of the New York Printers This Issue Was Printed in a Rural Newspaper Office

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

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War Board Recommends Unification

Exhaustive Report on Method and Means of Building up the U. S. Air Service

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ALLIANCE AIRPLANE, WITH 450 HP. NAPIER LION MOTOR, LIEUT. R. M. DOUGLAS, PILOT, READY TO START FROM LONDON TO AUSTRALIA

Keystone View Co.

A board of officers consisting of Major General Charles T. Menoher, Frank W. Coe, William G. Haan and William G. Snow was appointed by the Secretary of War in August to report on the question of establishing a separate department of aeronautics. The Board made an investigation of many individual reports, reports of boards, commissions and other documents bearing on the subject. It examined many witnesses, including important division, corps and army commanders who actually took part in combat using aircraft as part of their commands. Letters from military aviators advocating a separate department were received and considered.

Important Parts of the Report

Important parts of the report are:

Practically all men who have given this subject consideration are agreed upon certain fundamental facts which may be stated as follows:

(a) In future war aeronautics will play an increasingly important role, the magnitude of which will, in large measure, be in proportion to the capacity of the nation to produce aircraft and to train personnel for its maintenance and operation.

(b) On account of the short life of aircraft and the great cost of production and maintenance, no nation can in time of peace maintain military air fleets even approximating in size to such as will be necessary in time of war. Such military air fleets must, therefore, be provided after the beginning of the emergency. The nation which is prepared so that it can be the first to produce, equip and maintain a superior air force will have an undoubted advantage.

(c) If commercial aeronautics were a paying business, large plants would be established in the United States for producing commercial aircraft without other governmental stimulation than that provided for other business affairs. These plants would develop expert aeronautical engineers, expert mechanics, and all classes of personnel necessary for aircraft production and maintenance. In time of war the nation's producing capacity, already organized, would be diverted from the production of commercial aircraft to the production of military aircraft. This would be a comparatively simple propositon. The nation would also have a great reservoir of commercial aviators from which, in a short period of time, military aviators could be selected and trained, and a limited portion of its commercial fleet could be utilized without radical alterations for certain war purposes. Thus, at the beginning of the war, it would be possible to develop under military control, in a most expeditious manner, probably the largest and best military air force that any nation could produce.

Commerical Aviation Needs Aid

(d) At the present time commercial aeronautics is not a paying business; neither is there any prospect that commercial aeronautics will, in the near future, develop in any large measure by itself. Even with governmental support no definite period can be fixed, after which commercial aeronautics will be able to stand by itself. Up to the present time, Congress has not seen fit to make appropriations for the purpose of developing commercial aeronautics. This is the only means by which commercial aeronautics on anything like a large scale, and hence production on a large scale, can be developed in the immediate future. The extent of such development will be in proportion:

(1) to the size of annual government appropriations, and

(2) to the period of years for which such appropriaions are guaranteed.

Private capital will not undertake the development of an industry based upon a single appropriation without any guarantee as to subsequent appropriations which will be necessary for the continued maintenance of the industry.

(e) The government should not undertake the production of aircraft; such action could only be justified to counteract trade combinations against the government. Competition by the government with private industry will always tend to destroy the latter. Government production may be a necessity in the case of articles of no commercial value, as ordnance. On the other hand, no sound business reasons can be advanced for government production of commercially successful material, such as motor transport. The production of aircraft while not yet in this class, might, by adequate government assistance, eventually come thereunder. The eventual existence of large commercial air fleets, foreseen by many, would place it entirely in the latter class.

(f) Federal agencies should be provided for the adequate control of various matters connected with aeronautics, both commercial and military. These are discussed at length in the various reports herewith submitted and the mention of the following most important provisions is sufficient at this time:

(1) Provisions for furnishing to air fleets the necessary meteorological data similar to that now furnished by the Weather Bureau to shipping.

(2) National and international regulation of air traffic.

(3) The licensing of pilots.

(4) Inspection and licensing of aircraft.

(5) Standardization of signals and maps.

(6) Enactment and enforcement of laws relating to accidents and insurance.

(g) It is desirable that a single governmental agency be responsible for the procurement of all aircraft used in the government service, in order that duplication and waste may be avoided and that the producing industry of the country may be judiciously fostered in the placing of government orders.

(h) It is also admittedly desirable that a single governmental agency should be established for the purpose of developing work, in so far as these matters pertain to development common to all branches of aeronautics—military, naval and commercial. This agency should be provided with the means for carrying on experimental and research work and for testing materials. It should also be charged with the collection and publication of data valuable to private industry or individual inventors and, where not incompatible with inventive progress, with the standardization of material, equipment, and methods of construction.

(1) Various civil departments of the government have need of aircraft in the performance of their functions and in the improvement of their service to the public. Such appropriations as Congress may provide for these purposes will serve to aid the aircraft industry but can not purchase far reaching results

Lt. B. W. Maynard Greeted at Mineola

Left to Right—Sgt. Klein, Col. Archie Miller, Lt. Maynard, his father, mother and sister

4. With the exception of the foregoing, there appear to be three different lines of investigation which demand further study; these may be stated as follows:

(a) In case large Congressional appropriations be made for the purpose of assisting commercial aeronautics, what specifically are the means or methods whereby this purpose is to be accomplished?

(b) Is a separate Department of Aeronautics necessary to build up commercial aeronautics and control all questions relating thereto?

(c) If a separate aeronautical department or agency be established, should it include the aeronautical services of the army and navy?

These will be considered in order.

Hypothetically Considered

(a) In case large Congressional appropriations be made for the purpose of assisting commercial aeronautics what specifically are the means or methods whereby this purpose is to be accomplished?

In order to attempt a clear conception of just what is involved in this question, let us assume that the government has obligated itself to appropriate annually for a period of ten years the sum of $300,000,000. per year for the purpose of assisting commercial aeronautics. The total appropriation for these ten years then amounts to $3,000,000 000.

Next how is this to be expended?

It is impossible, of course, to present here definite estimates covering such expenditures, but not more than 10 per cent. of such appropriation need be devoted to subsidiary purposes, such as the development of the meterological service, the procurement and publication of maps, and the various other items elsewhere enumerated. It will also be admitted that allotments from the annual appropriations should be made for the establishment of commercial air routes. Such projects would demand large amounts of money; they would include the establishment of landing centers with an equipment of airdromes, machine shops and personnel; the establishment of emergency landing fields between the large airdromes and the equipment of the landing centers with various means of telegraphic and radio communication or control and navigational aids. In other words ,the project may be visualized by comparing it with the building of a railroad with roadbed, stations, roundhouses, telegraph lines, etc., complete except for rolling stock; and an invitation to private capital to provide the rolling stock and utilize the roadbed, free of charge. After all this is done, and after all of the various secondary matters have been given attention, there still remains in the realm of speculation the question as to whether or not private investors would utilize the air routes sufficiently to create what is being sought, namely, an adequate aircraft industry to meet the production needs of war. If the air routes would be so utilized, then practically the entire appropriation could be utilized, for the construction of such routes; if, on the other hand, the mere establishment of these routes does not produce the requisite air fleets to use them, it would be necessary to limit the portion of the appropriation used for these purposes and to retain a part of it for the purpose of rendering still more attractive to private capital and protection and operation of air fleets. The further inducement necessary might take the form of direct subsidy, such as, direct payment to any certain person or firm for the maintenance and service of an aeroplane and pilot. Such subsidies have heretofore found no place in our governmental policy, but it seems more than likely that they will become necessary if we are to embark upon a program which has for its object the adequate preparedness of this country for air defense in case of war. It is reported by the French Air Attache to the United States that in France direct subsidies are already in force. The French Government pays each company one fourth of the price of the airplane provided that this machine is acceptable to the Government as being capable of rendering service in time of war. The government also pays each company ten thousand francs per year per pilot as part salary for each pilot. In Great Britain the means so far employed are reported to be restricted to establishment and improving aerial routes but the present indications give no assurance that the desired results will be attained thereby.

Armament Supremacy

(6) The present reported feverish activity for the development of "commercial aeronautics," of certain nations already saddled with enormous debts, under the guise of developing a new and highly lauded system of transportation is, as a matter of fact nothing more than a new race for supremacy in armaments. The hope is expressed in the proposed treaties growing out of the World War that excessive armaments might be limited and thereby lessen the already great burden of taxation. It is not the intention of this Board to deny the wisdom of a policy which will place this nation in the front rank with regard commercial aeronautics or a proper state of defense. It is thought, however that this question should be stripped entirely of its camouflage and that the nation at large should be apprised of the real situation and the terms upon which it is to enter this contest.

(7) Is a separate department of aeronautics necessary to build up commercial aeronautics and control all questions relating thereto?

If a national policy be adopted by Congress covering a period of say not less than ten years and providing for large annual appropriations for the development of commercial aeronautics, as indicated in paragraph 5, a suitable agency for administering the expenditure of these funds is necessary. Such an agency should naturally control the procurement of all Government aircraft and aircraft material, the development work common to all types of aircraft, and many or all of the subsidiary activities. The determining factor as to the character which this governmental

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agency should assume is the size of such continued annual appropriations. If they are to be in the hundreds of millions of dollars annually, an executive department is suggested as a suitable solution. The question of the kind of agency that should be established if the government does not accept the foregoing as a policy will be taken up in a later paragraph.

(8) If a separate Aeronautical Department or agency be established, should it include the aeronautical service of the army and navy?

It is believed that certain fundamental considerations regarding this question may be enunciated as follows:

(1) Military forces cannot be efficiently trained, nor can they operate efficiently without an air force.

(2) An air force acting independently cannot win a war against a civilized nation, nor by itself, accomplish a decision against forces on the ground

(3) With respect to an army, an air force is an essential combat branch and forms an integral part of that army as do the other combat branches. To insure success, the Air Force must be controlled in the same way, understand the same discipline, and act in accordance with the army command under precisely the same conditions as do the other branches.

(4) In order to establish the control in battle, as outlined under the preceding section, the Air Force, equally with the other branches, must fully understand its exact functions in working with them. It must know their needs. It must be in full sympathy with them. It must think in the same military atmosphere and have the same esprit de corps. Such condiions cannot be brought about in any force unless it is an integral part of the command, not only during battles but also during the entire period of its doctrinal training. It must be a part of such command in fact and not a temporary attachment thereto.

(5) The foregoing apply equally to the Navy in practically all respects.

Whatever may be the decision as to a separate Aeronautical Department, the military air force must remain under the complete control of the Army and from an integral part thereof both in peace and in war.

* * *

An Aeronautical Commission

The report continues to give the views of Sir Douglas Haig, General Ludendorff and General Pershing, Captain M. C. Mustin and others.

The next part of the report is devoted to the uses of a military air force not controlled by the Army and gives a summary of the experiences of the so-called independent air force of the British.

For the supplying of equipment and general control of aeronautics the Board recommends (Paragraph 13) an Aeronautical Commission created by the President under specific provision of law—the head of this Commission to be a civilian with the title of Director of Aeronautics who should report the action of the Commission direct to the President. On the Commission should be one member from each government departpartment directly intersted in aeronautics; also one civiian member representing in genera, the producing industries.

This Commission should have authority to employ aeronautical engineers and experts of all classes, as well as the necessary administrative personnel to enable it to perform its functions, among which should be the following:

Arrested for Using the Bois de Bolougne As An Aviation Field

M. Poulain, who has the only self-propelled plane in the world was recently arrested for flying his machine along the Bois de Bolougne. The machine which M. Poulain drives is a bicycle with wings built out from the sides. He cannot fly for any distance but jumps along in stretches of about 50 feet at a time.

The top photograph shows M. Poulain making his flight along the Bois de Bolougne The bottom photograph shows the police arresting him after his flight.

(1) Control of all national and international questions pertainig to civil aeronautics.

(2) (a) Prepare and submit estimates fo appropriations necessary in the performance of its functions.

(b) Consolidate and transmit estimates submitted by all government departments for aircraft and aircraft material.

(3) Control the procurement of all aircraft and aircraft material bought by the government.

(4) Conduct all government development work pertaining to aeronautics except such as pertains solely to the Military and Naval branches.

(5) Prepare to meet in case of war the demands of the military and naval services for increased production.

Congressional Aircraft Committee

14. Congressional Organization For Supervision of Appropriations: One of the arguments in favor of the creation of an executive department of aeronautics is that such action would facilitate the creation of a single Congressional Committee to handle aircraft legislation and appropriations. At the present time these matters are in the hands of three or more commiitees and it is difficult to secure adequate supervision of their action but such supervision by a central committee of Congress will naturally result as to all major items if the recommendations of this Board become effectivee.

15. Organization of Military Air Force: There is no doubt that one of the sources, perhaps the most active source, of agitation for a separate Department of Aeronautics is the Air Service of the Army. It seems de-

sirable that the reasons for this be stated fully and frankly. The important reasons appear to be:

(a) A belief that it is desirable and essential to create a force for fighting purposes independent of either the Army or Navy.

(b) A belief that no future exists for the personnel of the Air Service so long as it remains a part of the Army.

(c) A beiief that a Military Air Force suitable to our position in the world will not be developed under the Army but that aeronautics will continue to be regarded as an auxiliary to other branches.

16. Conclusions:

(1) Peace-time air fleets at all adequate in size for war uses can not be maintained by any nation. The great air fleets necessary for war must be produced after war begins.

(2) To provide facilities for aircraft production at the beginning of war commercial aeronautics must be developed.

(3) Under present conditions, the only effective stimulant to the development of commercial aeronautics, is Government assistance in large annual appropriations guaranteed for a period of a considerable number of years. If this policy be adopted by the Government, these appropriations, in order to accomplish the result desired, must be continued until commercial aeronautics can stand by itself as a dividend paying business.

(4) The Government itself should not undertake the production of aircraft in Government factories unless trade combinations in the production of military aircraft should eventually be formed against it.

(5) Federal agencies should be provided for the adequate control of various national and international matters connected with aeronautics.

(6) A single Government agency should be responsible for the procurement of all aircraft used in the Government service.

(7) A single Government agency should have charge of all development work, in so far as same is common to all branches—military, naval and commercial. The agency should be provided with the means to carry on experimentation and research.

(8) The military and naval air forces should remain as integral parts of the Army and Navy and be completely under their respective controls both in peace and war, no matter what may be the decision as to the establishment of a separate aeronautical department or agency.

(9) There should not be created any military force independent of army or navy control.

Recommendations

17. Recommendations: As a result of its deliberations and conclusions, the Board submits the following recommendations:

(a) That the Army and Navy retain as integral and essential elements of their organizations and operating respectively under their complete control all military and naval air forces that may be provided by Congress.

(b) That further study be given the question of the details of organization of the air force for the Army, bearing in mind the fact that a military air force is an essential combatant branch of the service and should, in so far as may be practicable, be placed on an equal footing with the Infantry, Cavalry, and Artillery; and that in seeking the proper solution to this problem the personnel of the existing air service should be given full opportunity for an expression of their views.

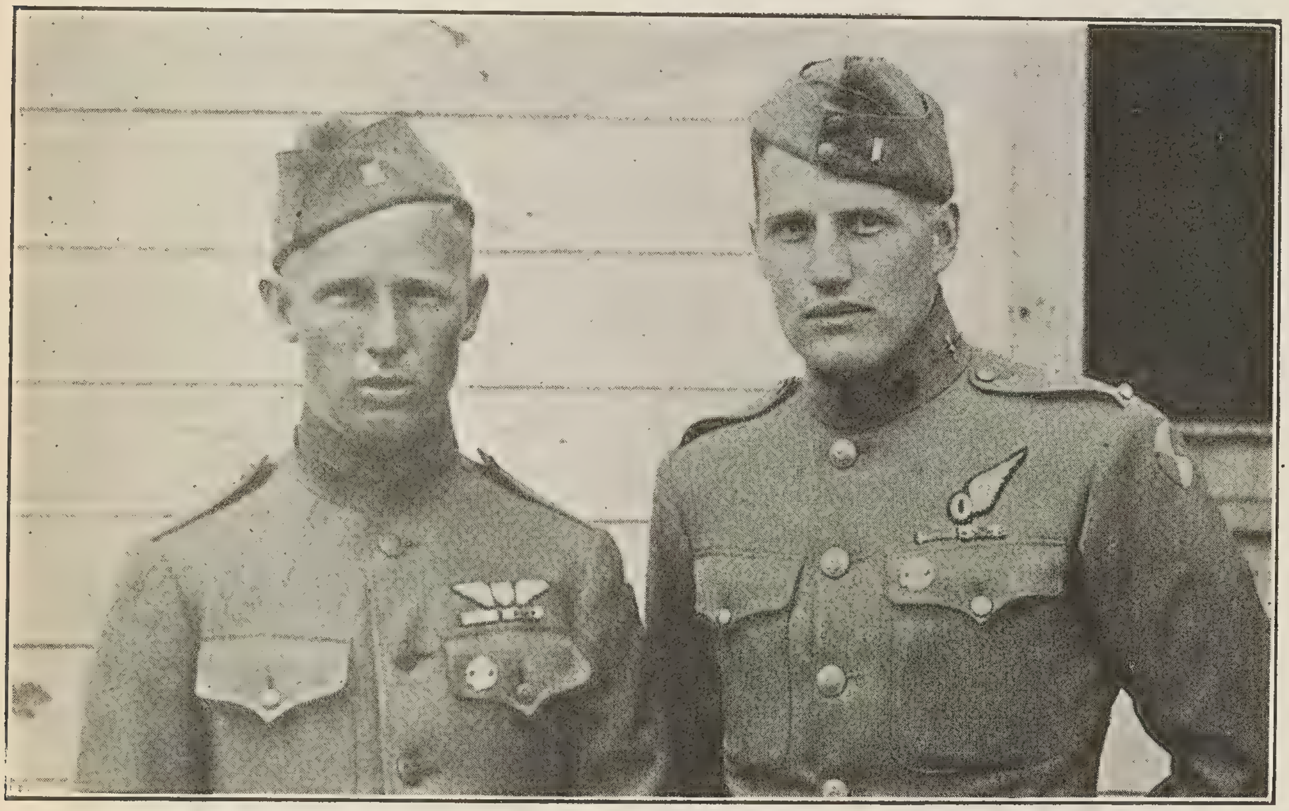
(c) That Congress should be requested to decide whether it desires:

(1) To make large annual appropriations guaranteed over a period of say not less than ten years for the stimulation of commercial aeronautics.

(2) To make appropriations which are to be devoted mainly to the improvement of the public service departments such as the Post Office Department or Military and Naval Services.

(d) If the policy indicated under (r)- (1) be adopted, an executive department of aeronautics is recommended as outlined in paragraph 7 of this report.

(e) If the policy indicated under (c) - (2) be adopted, a commission should be provided with personnel, powers., and duties as outlined in paragraph 13 of this report.



FLYING ON THE MEXICAN BORDER

Capt. D. H. Arthur and Lt. Howard T. Fleeson of the 12th Aero Squadron—Both Have Fine Records for Air Work in France

(c) *Underwood & Underwood*

AIR SERVICE PERSONNEL

The Secretary of War directs that under the provisions of Act of Congress, approved July 11, 1919, making appropriations for the Army for the fiscal year ending June 30, 1920, and continuing until June 30, 1920, the following allotment of personnel in the Air Service is announced: officers, 1,349; men, 11,000.

International A. S. C.

Senator Wadsworth, from the Committee on Military Affairs, submitted the following report:

The Committee on Military Affairs, to whom was referred the joint resolution (S. J. Res. 56) to enable the United States to participate in the work of the International Aircraft Standards Commission, having had the same under consideration, report favorably thereon, with certain amendments, with the recommendation that the joint resolution as so amended do pass. The amendments are to strike out the preamble of the resolution, and also to strike out all after the enacting clause and insert new language which meets more fully the committee's views and eliminates an appropriation of $50,000 originally requested. As reported by the committee, the authorized expenditure shall not exceed, for the current fiscal year, $6,000.

This proposal was first brought before the Committee on Military Affairs in June of this year, when officers of the Air Service of the Army were before the committee and presented their views on the proposal. When the Army appropriation bill was under consideration, the committee recommended that an amendment be added, in the language which it is proposed to insert in the resolution in lieu of the original; but the amendment was stricken from the appropriation bill in the Senate on a point of order. The War Department is exceedingly anxious that this legislation be enacted for the reasons stated in a memorandum prepared by the Director of the Air Service and transmitted to the committee by the Secretary of War. The letter of the Secretary and the accompanying memorandum are as follows:

SEPTEMBER 9, 1919.

MY DEAR SENATOR WADSWORTH: I beg leave to inclose a memorandum just received by me from General Menoher. I am sending this to you personally, because I think you will be able to tell me whether there is any likelihood of the legislation in question being favorably considered. If there is not, I think I ought to ask the Secretary of State to notify the other Governments that America will not participate in the activities of the International Aircraft Standards Commission.

Cordially yours,

NEWTON D. BAKER,
Secretary of War.

HON. JAMES W. WADSWORTH, JR.,
Committee on Military Affairs, United States Senate.

SEPTEMBER 6, 1919.

Memorandum for Secretary of War.

1. It is requested that your office take such action as may be necessary to obtain action from Congress in the matter of representation on the International Aircraft Standards Commission.

2. In accordance with instructions from your office, letters were forwarded under date of May 28, 1919, to the chairmen of the House and Senate Military Affairs Committees, requesting that Congress enact, at an early date, special legislation providing for the appointment of a national aircraft standards committee and for representation at the meeting of the International Aircraft Standards Commission, which was at that time scheduled to meet at Paris in the latter part of June. The letters were accompanied by a draft of a bill which it was felt would accomplish this purpose. The House Military Affairs Committee apparently accepted the bill as it stood. The Senate Military Affairs Committee held a hearing on the subject, at which Col. O. Westover, A. S. P., testified in detail as to the purposes of this commission. The Senate Military Affairs Committee recommended the measure in a rider attached to the Army appropriation bill, but the rider was ruled out of the bill on a point of order, raised by Senator McKellar.

3. Senator Wadsworth, chairman of the Senate Military Affairs Committee, was some time later requested to inform this office as to whether or not any action on this bill could be hoped for in the immediate future. He stated that it was his belief that such a measure would not pass Congress at that time.

4. The meeting of the International Aircraft Standards Commission, which was scheduled in June and which was postponed at the suggestion of this Government, has been repeatedly postponed in the hope that the United States would be represented at the meeting. It is felt, therefore, that an earnest effort should be made to obtain some definite, final action on the part of Congress in this matter. If it is impossible to enact legislation to permit our Government to be properly represented at this meeting, notice should be given to that effect. If it is possible to secure representation, it is important to call for some special action in order that foreign Governments which have allied themselves with this movement may not be put to continued inconvenience due to apparent vacillation on the part of our Government in the matter.

CHAS. T. MENOHER,
Major-General, United States Army,
Director of Air Service.

Admiral Sir David Beatty on a Separate Air Service

An Organization Desirable to Control All Aviation Outside of Army and Navy

The following digest of an interview with Admiral Sir David Beatty by an American naval officer gives what can be considered the point of view of the greatest British authority on naval policy:

Admiral Beatty stated that he had supported the creation of the R. A. F., for the reason that at the time it was the only way he could get the personnel and material he needed in the Grand Fleet; he thought that a young and new service would be keen to make a reputation with the two older services (Navy and Army) by being particular not to let anything interfere with Naval and Army Aviation needs. In that way, with production centralized, they would get by the troubles they were having for supply of material. But that was his idea during the war; now that the war is over, he does not consider the R. A. F. organization a proper one, as far as it applies to the Navy and Army; the phrase "Navy and Army and Air" is an attractive one but it isn't sound in each profession—Navy and Army—and there should be no independent fighting force in the air

In a separate Air Force there is not a sufficient guarantee for the future for young men when they consider what will become of them when they have passed the age for flying; the proportion of administrative billets in the Air Force is too small.

As far as the Navy is concerned flying is only a small part of Naval Aviation work for there is so much more that the Officers of Aviation duty must know. Officers of the Navy who want to go in for aviation duty could take it up in the same way as Officers specialize in gunnery and torpedoes (After finishing a cruise as watch keepers, they elect to take up one of the specialties). The Officer aboard ship for aviation duty must be a Naval Officer; the spotter in an aeroplane is just as much a part of the ship's organization (fire control system) as the Officer that rings the bell for fire.

He considered that the value of the Independent Air Force for England was somewhat over-rated: results of the war showed that damage by bombing, both physical and moral was not as great as expected; for example, in spite of the tons of high explosives dropped on Bruges there was surprisingly little damage. The moral effect of the bombing wears off, for the population gradually becomes accustomed to it. Referring to the organization requirements of the United States, he said that with our geographical position there was no excuse at all for an independent fighting Air Force. But he does believe that a separate Air organization is desirable, both for England and any other country, to control all aviation production for all, including Navy and Army.

Air Service Legislation

The committee of conference on the disagreeing votes of the two houses on the amendments of the House to the bill (S.2622) to provide necessary commissioned personnel for the Army until June 30, 1920, having met, after full and free conference have agreed to recommend and do recommend to their respective Houses as follows:

The Senate receded from its disagreement to the amendment of the House and agreed to the same with an amendment as follows:

In lieu of the matter proposed by the House, insert the following:

"That until June 30, 1920, the Secretary of War is authorized and directed to maintain such commissioned personnel in addition to the officers of the Permanent Establishment and to retain at their temporary grades such officers of the Regular Army as in his judgment may be necessary for the proper performance of the functions of the Military Establishment: Provided, That additional officers so maintained shall be selected, so far as practicable, from officers and enlisted men who served during the emergency and are applicants for appointments in the Permanent Establishment. Provided further, That after October 31, 1919, the total number of commissioned officers, exclusive of retired officers and disabled emergency officers awaiting discharge upon completion of treatment of physical reconstruction, shall at no time exceed 18,000. Provided further, That no officer on the active list shall be detailed for recruiting service or for duty at schools and colleges, not including schools of the service where officers on the retired list can be secured who are competent for such duty. And further provided, That hereafter officers retired for physical disability shall not form part of the limited retired list. And provided further, That *1200 emergency officers shall be assigned to the Air Service, of whom not less than 85 per cent shall be duly qualified fliers."*

And the House agreed to the same.

BRITISH AIR COMMODORE L. E. O. CHARLTON PHOTOGRAPHED IN HIS MACHINE JUST BEFORE THE START OF THE TRANS-CONTINENTAL RELIABILITY TEST

[C] *U. & U.*

OREGON LANDING FIELDS

The State of Oregon has officially recognized the necessity for establishing aviation landing fields at once, so that municipalities may be ready to accomodate freight and passenger carrying aircraft, which, according to Governor Ben W. Olcott, are to be real factors in the practical life of the future.

In a letter to the Manufacturers Aircraft Association, Gov. Olcott tells of the remarkable service obtained by the aerial fire patrol by means of which millions of dollars worth of timber lands have been protected.

"With our millions of acres of timbered area, the possibilities of development of a practical aerial fire patrol system became at once apparent," he writes. "The genuine enthusiasm of Oregonians resulted in prompt enlistment of the supports of the Army Air Service, and for many weeks Curtiss as well as De Haviland planes have been maintaining regular aerial patrol service over routes which touch a greater portion of our heavily timbered sections. During the months in which this service has been maintained not a single serious accident has occurred, although some of the routes cover hundreds of miles of country where no such thing as a landing place is in sight.

"Our municipalities have displayed the keenest interest and rivalry in helping to develop navigation in the air and landing fields have been prepared in a number of them. We realize that aerial navigation in Oregon is still in its infancy, but I venture the suggestion that the keen interest which has been manifest will result next summer in the establishment of suitable landing fields in practically all of the larger of the cities and towns in the State and in many of the smaller towns. No difficulty has been experienced in convincing the people of Oregon that aerial navigation is to be the real factor in the practical life of the future and that the airplane is more than merely a toy for exhibition purposes."

LIBERTYS OVER THE ALPS

One of the Caproni triplanes, fitted with the 18-passenger cabin, flew from Milan over the Alps to Lyons, Paris, Bruxelly, Amsterdam on its way to London. The machine is fitted with Liberty engines, low compression, and it is believed that that is the first time Liberty engines flew in such peculiar conditions of temperature and atmosphere as exist over the Alps.

L. D. GARDNER. . *President and Editor*
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Formerly Air Service Journal

Opinions on the Aeronautical Crisis

HERE is a digest of the newspaper comment throughout the United States concerning the aeronautical crisis. The people demand that their interests in the air be protected by immediate and effectual Congressional action. Reprinted by the Gardiner-Moffat Company, Inc., publishers of AVIATION and AIRCRAFT JOURNAL, New York:

CHICAGO EVENING POST, Nov. 3, 1919: "Congress declines to appropriate $15,000,000 for development of the army air service. Gen. William Mitchell, in charge of the air service, declares that the progress achieved in aviation during the war will be lost as a result of this short-sighted economy. America is surrendering the air at the very time when other nations are devoting millions to establishing themselves securely in this new domain * * *. And ten years from now some ardent patriot at Washington will rise to protest with futile indignation against Great Britain's mastery of the air."

BALTIMORE NEWS, October 31, 1919: "It is strange that Congress should show so little interest in a development which has been urged by Democratic and Republican newspapers alike * * *. It is stated that not over 40 per cent of the aircraft production machinery built up by the war, and at such enormous expense, now exists; and that this is practically idle."

SAN FRANCISCO BULLETIN, October 30, 1919: "This country must wake up on the subject of aviation and it must be a waking up of the people if Congress is to be aroused from its slumbers. If our lawmakers refuse to lead they must be led, for it is not in the nature of true Americans to accept a back seat in what is now recognized as the first line of defense of any country."

SPRINGFIELD (Mass.) REPUBLICAN, Nov. 2, 1919: "The action of Congress in rejecting the proposal for a $15,000,000 appropriation for the air service seems inexplicable."

ROCHESTER (N. Y.) TIMES-UNION, Nov. 6, 1919: "No one knows whether the dreadnoughts now on the ways will prove of any permanent value as instruments of defense. But it is fairly certain that aircraft are to be of increasing importance in both military and commercial fields."

RICHMOND (Va.) JOURNAL, Nov. 7, 1919: "As matters exist today should the United States be suddenly forced in the interest of American lives and property to send a military expedition into Mexico it would find it hard, if indeed possible at all, to muster three fighting air squadrons for service. And all of this is seemingly according to the desire of Congress, for it cannot plead ignorance. The war has taught us nothing. We steadily slip back and will soon see a return to our dangerous pre-war attitude. And for the blunders of those who place us there again the whole nation must pay."

WASHINGTON (D. C.) STAR, Nov. 2, 1919: "While the House and Senate quibble over appropriations and the Army and Navy won't get together on a joint program, the air service goes flooey, and the United States is to be a little child among the nations for self-defense, subjecting the population to possible air attacks hereafter. Wonder if it will take a flight of German-manned enemy airplanes dropping bombs over San Francisco, San Antonio, Dallas, and Galveston before this government 'hops off?'"

PHILADELPHIA PRESS, Nov. 2, 1919: "This industry (referring to the airplane industry) which has a future as certain as death and as big as the skies can still be saved and every person interested in the welfare of the nation in the air is hoping against hope that it will be saved before it is too late."

NEW YORK EVENING POST, Nov. 8, 1919: "Congress is being urged to take a novel point of view—that is to look ahead for the next ten years, and make appropriations for an annual air budget of $300,000,000 to stimulate commercial industry, and to carry out experiments for the army and navy departments."

EVENING SUN, (New York City) Nov. 1, 1919: "* * * A moment's thought will show that the bungles and delays in airplane production during 1917 and 1918 prove nothing against the merit of the conception that we needed the strongest air force we could produce and at the earliest instant it could be had. The failure to produce in time does prove something—something very different; it proves that we cannot afford to put off airplane development until war comes again."

NEW YORK WORLD, Oct. 30, 1919: "The refusal of Congress to grant an additional appropriation of $15,000,000 means the deliberate wrecking of the aircraft service of the Army. Repeated warnings have been given of the disastrous results that must follow if it adhered to its policy, but neither arguments nor appeals to common sense have availed to change the position taken by the House * * *. Not merely is the development of aviation in the United States along lines parallel to those followed by more progressive nations to be prohibited, but the aircraft service of the Army, inadequate as it already is, will be reduced to a state where it can no longer operate in the field. For this state of affairs the sole responsibility rests upon Congress."

NEW YORK SUN, Oct. 28, 1919: "It would be false economy of the most most expensive sort for Congress to neglect or refuse to appropriate enough money to build and man the airships we need now and shall need in the future to protect America and Americans from attack. Parsimony today will mean unpreparedness tomorrow."

NEW YORK TIMES, Oct. 31, 1919: "Shall one of the great lessons of the war, the determining value of the airplane in any conflict on land or sea, be lost on us because we love our isolation and prefer to muddle along in our own self-satisfied way of doing things, crossing a bridge only when we come to it, a habit for which we always pay dearly? Presumably it will take some time longer to convince Congress that an Air Ministry is essential if military aviation is to be developed along the lines of progress and not to lag and retrograde, but there should be no hesitation about appropriating the additional $15,000,000 asked for. It is not too late to reconsider."

BROOKLYN TIMES, Nov. 1, 1919: "Under the circumstances it seems like poor economy to fail to provide for the airplanes demanded by the army."

NEW AIRPLANE MOTOR

The Halford Airplane Motor is a new engine about to be placed on the market, and is now being built by the Auto Motor Repair Co. of Brooklyn.

The motor is a modified Ford type, with all the best features retained and many refinements introduced. It develops 35-40 hp. at 1800 r. p. m. The company's engineers state that there is actual reduction in dead weight, without impairment of ruggedness or durability.

Some of the features are Bosch magneto ignition or Atwater Kent ignition, Zenith Carburetor, special oversize valves, forced feed lubrication, Zephyr piston special leak proof rings, and special cooling system which permits real cooling.

Two low price models, varying only in speed, range and minor points have been built.

The motor has been specially built for a small, light, popular priced airplane to take off and land in a small space.

BOSCH OFFICERS ABROAD

Arthur T. Murray, President of the American Bosch Magneto Corporation, has gone on an extensive trip abroad for the purpose of investigating the export field as it aplies to the products manufactured by the big elecrical company of which he is president.

Accompanying Mr. Murray is G. J. Lang, assistant to the president at Springfield, whose activities with the organization are broad and of such scope as to make this overseas trip of extreme value to the company.

The tour abroad includes a visit to England, France, Brussels, Switzerland and Italy. It is expected that it will take at least three months to complete the investigation in regard to the sales possibilities of Bosch products abroad.

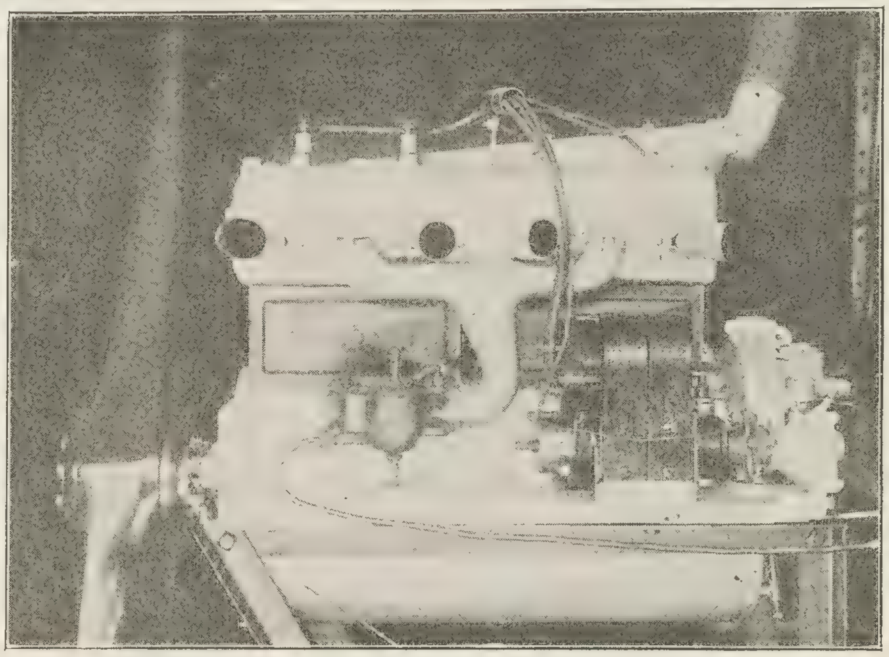
BRISTOL SERVICEABILITY

Of interest as proving the serviceability of a properly constructed airplane has been brought to the notice of visitors to the Amsterdam Acronautical Exhibition. In a nearby aerodome is a Bristol fighter delivered by the constructors in September, 1917. It was immediately put into commission under active service conditions, and after doing considerable work in this direction unfortunately landed in Holland. The pilot was naturally interned and the machine was soon after bought by the Dutch Government. Though it has been continuously flown by Dutch officers it has never been repaired or renovated in any way, and every unit is exactly as when it left the Bristol works. Even the dope has never been renewed. The machine is still in service and in great favor with the Dutch pilots.

GIBBONS WITH WETMORE

A. G. Gibbons, formerly superintendent of tools and supplies of Winslow Brothers Co., Chicago, which company had a contract for a million shells for the Government, has become affiliated with the Wetmore Reamer Co. of Milwaukee in the capacity of production engineer.

Mr. Gibbons was formerly with the Cadillac Company and Brown & Sharpe for many years. The Wetmore plant has been rearranged and additional equipment installed under Mr. Gibbons' direction, and the weekly production of the Reamers considerably increased.



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We Have No More
Used Canadian Training Planes—

the 350 Canadian Training Planes purchased from the Imperial Munitions Board of Great Britain have been disposed of.

the unprecedented demand for these "Canucks" by pilots who use them for commercial purposes exhausted our supply much earlier than we anticipated.

a few practically new Canadian Training Planes have been released for sale and are now ready for immediate delivery.

the fuselages, wings, landing gears, etc., are new and the O-X5 engines have been completely overhauled and are guaranteed.

the price is $3000 f. o. b. Toronto.

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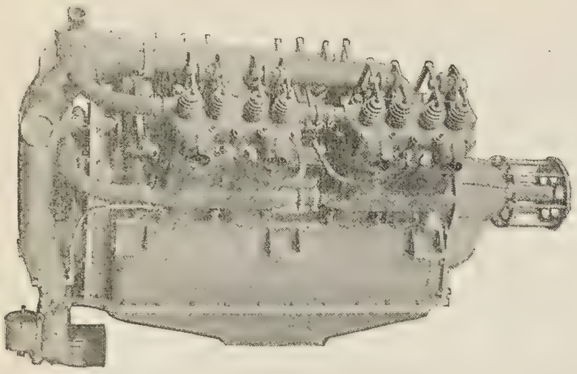

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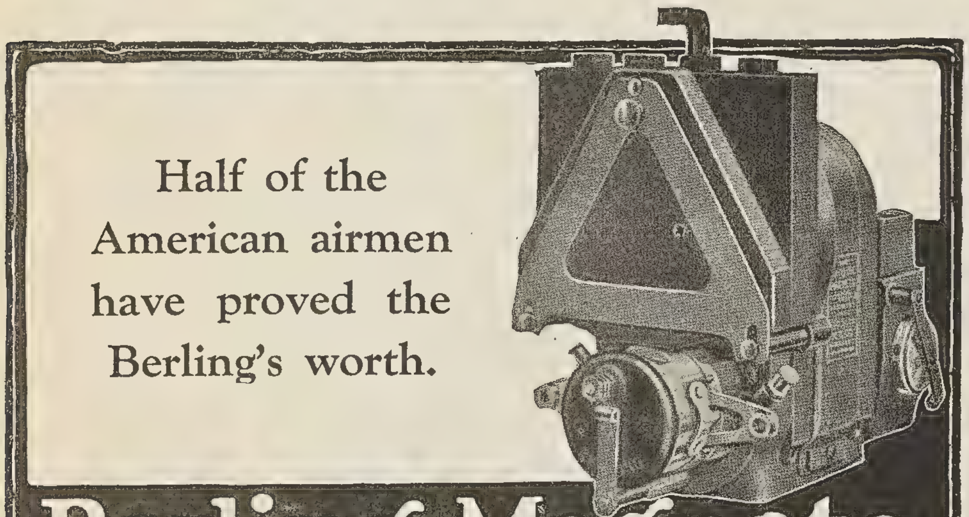
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Upward of 5,000 gallons of Jeffery's Patent Waterproof Liquid Glue has been used by the U. S. Navy and War Departments during the past year, and as much more by the various manufacturers of seaplanes having government contracts.

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Rates, 25 cents per agate line per insertion. Black face type, 50 cents per agate line. Forms close Saturday preceding date of publication.

Demobilized R. A. F. officer and pilot, with 12 Huns to credit; winner of "Distinguished Flying Cross" and other medals; 1200 flying hours on 24 different types of machines; 500 hours on active service in France. Willing to make Trans-Pacific flight. Anxious to get into commercial aviation. Open to any reasonable proposition. Address: Aviator, Fayetteville, N. Y.

FOR SALE—Well equipped airplane factory, consisting of five modern well lighted buildings with complete wood mill, machine shop, wire shop, ventilated dope house, cut-up plant, approved dry kiln, and all other equipment necessary to conduct a well regulated factory. The property comprises 4½ acres, spur on transcontinental railway. Two flying fields within short distance. Write for further details. Liberty Iron Works, Sacramento, California.

Sale of Seaplanes, Engines and Spares by the Navy

There will be offered for sale by OPEN SALES AT APPRAISED PRICES at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., the following aeronautical equipment at the prices stated each.

69	HS-2-L Flying boats	$6,160.00	Brooklyn, N. Y.
26	Sets spare parts for HS-2-L	1,500.00	"
72	Handling trucks for HS-2-L	200.00	"
46	H-16 Flying boats	11,053.00	Philadelphia, Pa.
46	Handling trucks for H-16	300.00	"
20	F-5-L Flying boats	12,400.00	"
20	Handling trucks for F-5-L	300.00	"
68	Aeromarine type 39-B seaplanes	3,000.00	Gloucester, N. J.
10	Sets spare parts for 39-B seaplanes	2,500.00	"
14	Handling trucks for 39-B	75.00	"
10	Aero Model 40 Flying boats	4,000.00	Hampton Roads, Va.
1	Seaplane JN type twin engine	2,000.00	Philadelphia, Pa.
1	Aeromarine type 39-A seaplane	1,500.50	Gloucester, N. J.
245	Curtiss OXX-6 Engines (new)	1,207.50	"
	rtiss OXX-6 Engines (used)	690.—1,035.00	"
13	Curtiss OX-2 Engines 90 HP	1,035.00	"
3	Curtiss OX-5 Engines 90 HP	1,035.00	"
13	Curtiss OXX-3 Engines 100 HP	690.—1,035.00	"
2	Hall-Scott engines 100 HP	1,150.00	"
12	Gnome engines 100 HP (new)	1,500.00	"
20	Gnome engines 100 HP (used)	900.00	"
2	Salmson-Hydro-Glycier engines 220 HP (used)		
7	Salmson-Hydro-Glycier engines 220 HP (used)		
	Type A-9 (Direct drive)	175.00	"
	Type A-2-C (Chain drive)	175.00	"
1	Boeing Tractor seaplane	1,500.00	"

Appraised value of used motors depends upon number of hours flying time. Most of this equipment is new and in excellent condition; many of the planes have never been uncrated.

The above equipment is stored at the Fleet Supply Base, South Brooklyn, N. Y., Naval Aircraft Factory, Philadelphia, Pa., Naval Aircraft Storehouse, Gloucester, N. J., Naval Air Station, Hampton Roads, Va., and Naval Operating Base, Hampton Roads, Va. The notation opposite the items gives location where stored. Prices are f.o.b. point of storage.

Sales will be made subject to prior sale and approval. The quantities and appraised values are subject to change without notice.

Applications to purchase any of the above equipment should be made to the Salvage Section, Bureau of Supplies and Accounts, accompanied by deposit for 5 per cent. of the amount bid. Effort will be made to make awards in the order in which offers are received.

Inspection is invited and may be arranged for with the Supply Officer of the above Naval Stations. Schedules of Sale giving full description and complete data as to terms of sale are obtainable from the above officers or from the Salvage Section, Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

JOSEPHUS DANIELS,
Secretary of the Navy.

10-6-19

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These are a special development for O. X. Motors on J. N. Machines, now being made in large quantities and ready for immediate shipment on receipt of $15.00 deposit. C. O. D. for balance, with examination allowed before acceptance and safe delivery guaranteed. Every one bears the Paragon mark with all that mark implies. Get our General Booklet and List for other designs etc. Write today.

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Forest Fire Patrol

Pursuant to letter from the Forester to the Secretary of War, endorsed by the Adjutant-General to the Director of Air Service and approved by the Director of Air Service, requesting co-operation and assistance in conducting experiments to determine the value of aircraft in forest patrol work, the experiments to be undertaken in California, a conference was held in the office of the Chief of Operations Division on March 27, 1919, with Messrs. Potter and Waha of the Forestry Service.

This was the initial inauguration with the Forestry Bureau, and it was agreed at this conference to instruct the commanding officers of March, Mather and Rockwell Aviation Fields and Ross Field Balloon School to co-operate and work out forest patrol routes in conjunctin with the District Forester.

The District Forester subsequently called upon and conferred with each of the commanding officers of the above fields, and they arranged to have certain specified routes flown daily, and in some cases twice daily, reports to be rendered by radio, parachute containing report of location of fire landing at special telephone patrol boxes and by returning to their fields and telephoning location of fire.

The balloon field established balloon observation during practically the entire day, and an auxiliary observation station at Mount Wilson. In addition they furnish a one and one-half-ton truck with fifty-gallon water tank and a detail of ten men to be available at all times as a protective measure.

These patrols were all inaugurated on June 1, and have been highly successful in their operations since that time, reporting a number of fires, some of which were in dangerous localities, very accurately, within one mile of their exact location, these reports reaching the District Forester some times within fifteen minutes after their origin.

Radio equipment is to be installed on all planes connected with this work at each field, and a system of reporting in by radio over specified localities during each patrol is contemplated. This will greatly increase the safety factor in this work in case of a forced landing, as well as increase the efficiency of the patrol service.

The District Forester and the Forester have expressed their hearty appreciation for the consideration and co-operation shown the Forestry Bureau by the Air Service in connection with this enterprise.

Mather Field Staff (Sacramento, Cal.) during the week ending June 21 made twenty-one flights over the National forests, discovering four fires, which were reported to the Forestry Service at Placerville, Cal. The total mileage of the patrol was 3000, and the patrol pilots were 53 hr. in the air. The pilots for the week were Lieutenants Tobin S. Curtis, E. F. Evans, Sergeant First Class Cecil W. Bickley and Private Frank McKee. The special forests patrolled were the Stanislaus, Tahoe and Eldorado.

March Field Staff (Allessandro, Cal.). Twenty-four trips were made, occupying thirty-eight hours, covering 2500 miles. Officers participating, Lieuts. I. J. Williams, H. F. Colliver, R. J. Pilcher, P. D. Williams and C. E. Stewart.

Rockwell Field Staff (San Diego, Cal.). Eight flights were made in twenty-six hours and twenty-six minutes, covering a distance of 2115 miles. Pilots participating: Lieuts. John R. Morgan, Chas. R. Wing, Maurel K. Rabenstine, Geo. T. Condron, Harry W. Brokaw and Barnard Cummings.

Summary, not including the balloon observation:

Minutes in the air	7046
Miles of flight	7615
Number of flights	53
Number officers and men participating	15

To Train Army Officers

Acting on the suggestion of Dr. Richard C. Maclaurin, President of the Massachusetts Institute of Technology, Chairman Kahn of the House Committee on Military Affairs introduced on Oct. 18, the following bill (H. R. 8314 amended):

"A bill to provide for the training of officers of the Army in aeronautic engineering and the issue of equipment and materials therefor.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of War be, and he hereby is, authorized to detail such officers of the Army as he may select, not exceeding twenty-five at any one time, to attend, and pursue courses of aeronautic engineering or associate study at such schools, colleges, and universities as he may select.

"SEC. 2. That the Secretary of War is authorized to pay tuition for the officers so detailed and to provide them with necessary textbooks and technical supplies from any moneys available for the air service of the Army not otherwise specifically appropriated, and he is authorized to furnish to institutions to which officers are so detailed such equipment and material belonging to the War Department for use in connection with courses in aeronautic engineering, as he may deem advisable, subject to such rules for use, compensation for use, accounting, report, and the return as he may prescribe.

LIEUT.-COL. CASTLE RESIGNS

The resignation by Benjamin F. Castle, of his commissions as temporary Lieutenant-Colonel, Air Service, and Captain, Infantry (Regular Army) was accepted by the President, to take effect Oct. 20th.

Thomas

THOMAS-MORSE AIRCRAFT CORPORATION
CONTRACTORS TO THE U.S. GOVERNMENT
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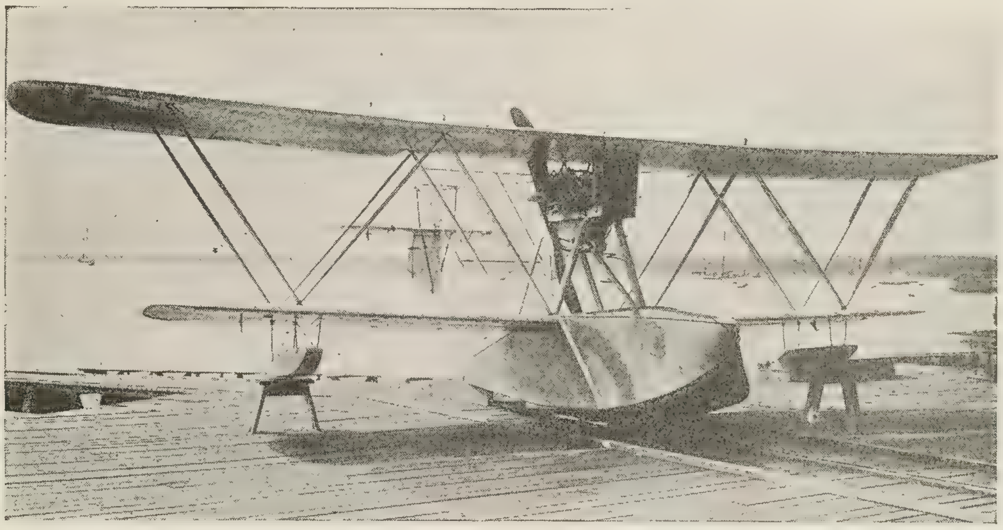
The newest Vought Product, Model VE-10 3-Place Flying Boat—



¶ The unrivalled character of the Design and Performance, of course, goes without saying.

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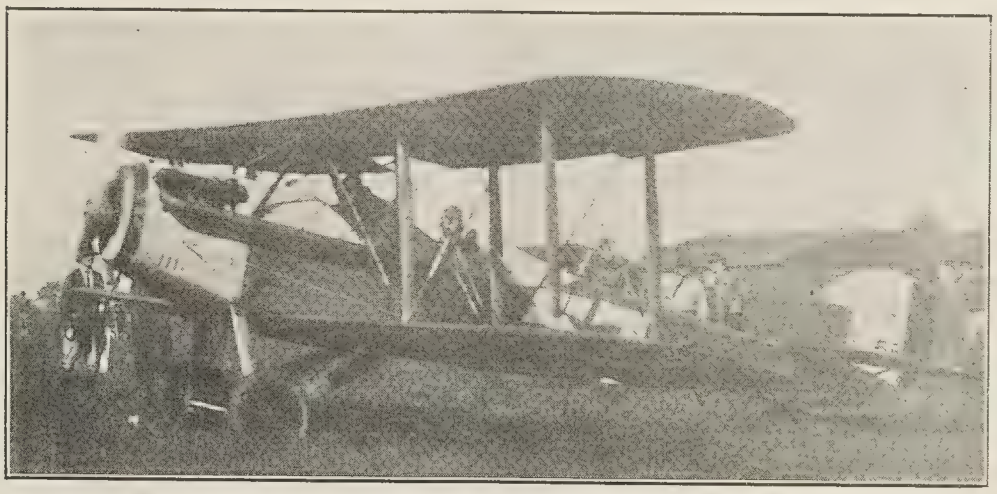
The Vought VE-7 2-Place Training and Sport Airplane—



¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

¶ Adopted by U. S. Army Air Service as the Standardized Advanced Training Type.

¶ Immediate Delivery for Civil Use.

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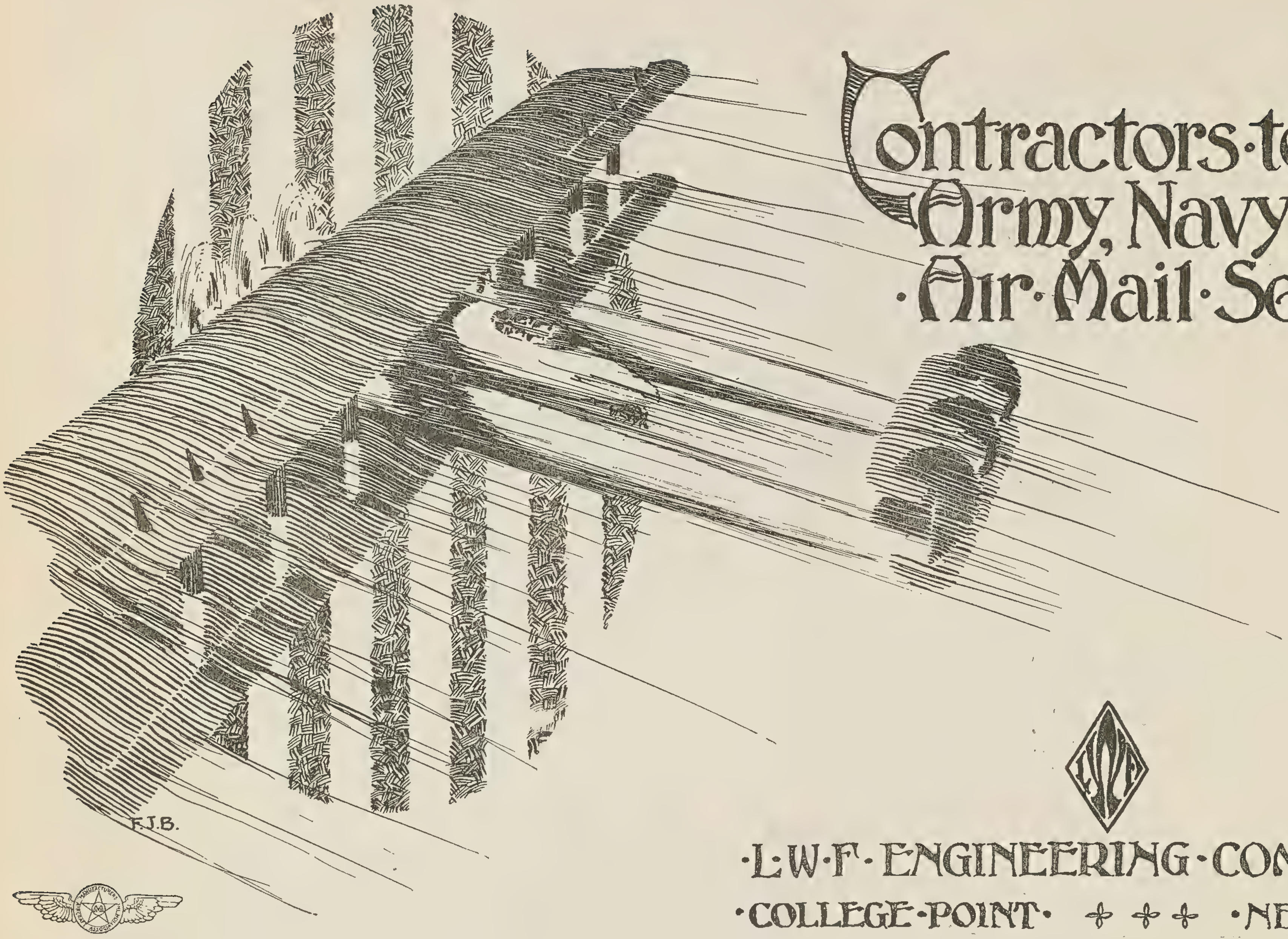

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Will Specialize in Filling the Individual Requirements of

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ROLLS-ROYCE

THE FUTURE OF FLYING
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THE FOLLOWING NOTABLE PERFORMANCES STAND TO THE CREDIT OF

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Of 122 Hadley-Page Aeroplanes completed in England before the signing of the armistice 113 were fitted with ROLLS-ROYCE ENGINES

Of 1524 "Bristol Fighter" Aeroplanes completed in England at the same date 1364 were fitted with ROLLS-ROYCE ENGINES

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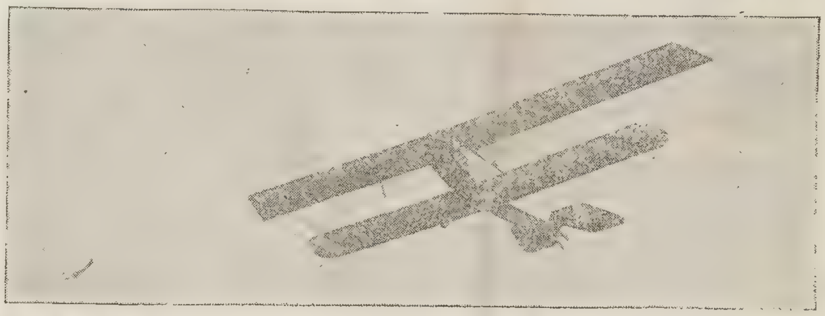

WISE pilots are starting a business of their own with a rebuilt Curtiss JN (some cost as little as $2,000) carrying passengers and giving exhibition flights. Some have paid for their planes in the *first few days.*

Write for our special proposition and *facts* about earnings. If there is no Curtiss dealer in your territory, we have something of interest for you.

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V #19

AIRCRAFT JOURNAL

November 8-15, 1919 Every Saturday Price Ten Cents

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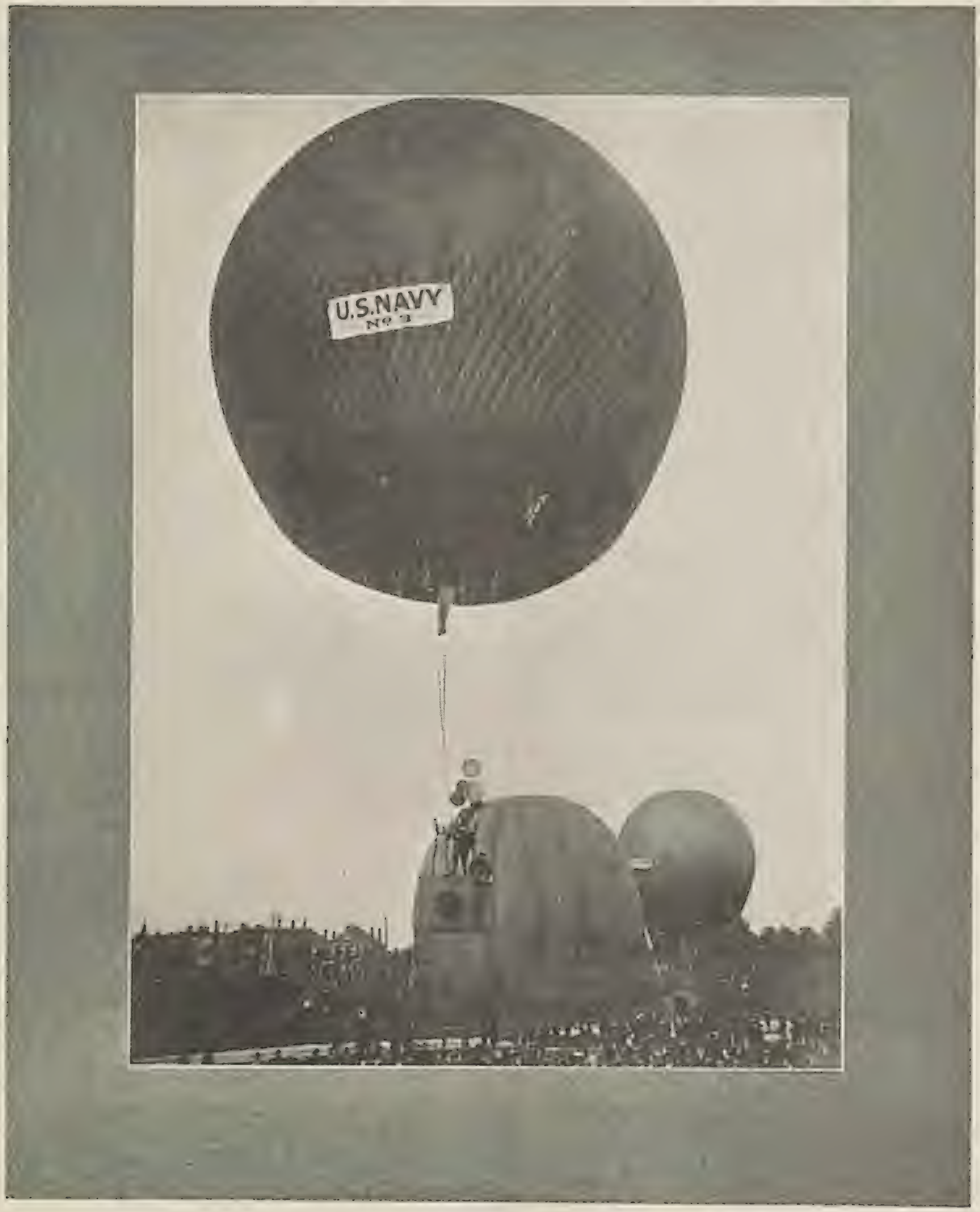

Photo by World Wide Photos

Army and Navy Balloon Race

Navy Balloon No. 3 About to Start from the Grounds of the Missouri Aeronautical Reserve Corps, St. Louis

DEC 2

Owing to the General Strike of the New York Printers This Issue Was Printed in a Rural Newspaper Office

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

The Glenn L. Martin Company
CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

Transcontinental Race Winners

Pearson First in Round Trip Speed, with L. H. Smith and Worthington Second and Third

Here are the official figures of the Army Transcontinental Airplane race which began October 8 and was declared closed November 4.

New York—San Francisco Reliability Test—Rules and Regulations Issued Before the Race by the Director of Air Service

THE TEST

1. The New York—San Francisco transcontinental reliability test consist of two flights, both starting on October 8th, 1919, at 9:00 a. m., one from New York, and the other from San Francisco, both running separately and independently on the same route (See columns 2 and 3):

COMMUNICATIONS

2. The contest is under the direction of the Chief, Training & Operations Group. All communications will be addressed to the Director of Air Service, attention Chief, Training and Operations Group.

COMPETITORS

2. The test will be open to Army pilots recommended by Commanding Officers of fields in the Eastern, Central and Western Departments, flying machines rated not less than one hundred miles per hour.

CONTROL STOPS

3. All machines will be obliged to land at the control stops and remain at least 30 minutes. Control stops will be in command of an officer who will have full authority for the interpretation of these rules and regulations, should occasion arise during the competition. Pilots will be permitted to remain at control stops as long as they desire up to 48 hours, and this time may be extended if in the opinion of the control stop commander, the weather does not warrant his departure. Where possible, the control stop commander will light a smoke smudge to afford the pilot an extra check on the field. Bad spots will be marked with red flags and indicated on the sketch submitted to adjacent fields.

LOCATION OF FIELDS

4. To insure accurate description of location of landing fields, pilots will question the officer commanding each control stop before proceeding. This officer, in addition to his other duties, is responsible that he has in his possession a map or sketch of the two adjacent fields, east and west, showing the exact location of the landing field with respect to the main land marks of the town; and he is also responsible, in turn, to each of the fields that he furnishes similar information concerning his own field to the two adjacent fields, before October 8th.

DEPARTMENT AIR SERVICE OFFICERS

5. For the information of all concerned, the Department Air Service Officers concerned are responsible for the selection and preparation of adequate landing fields at the stops named which are located within their department and for the operation of same in accordance with

(Continued on page 4)

WINNERS OF ROUND TRIP—ALL TYPES

	Pilot	Passenger	Type of Machine	Hrs.	Time Mins.	Sec.
1.	2nd Lt. Alexander Pearson	Sgt. R. Atkinson	DH-4	48	14	08
2.	Capt. L. H. Smith	1st Lt. F. W. Ruggles	DH-B	54	14	13
3.	2nd Lt. R. S. Worthington	None	SE-5	54	21	55
4.	Capt. John O. Donaldson	None	SE-5	56	16	12
5.	2nd Lt. E. H. Manzelman	C.S.M. M. C. Goodnough	DH-4	67	37	49
6.	1st Lt. Belvin W. Maynard	Sgt. W. B. Klein	DH-4	68	29	58
7.	Lt. Col. H. E. Hartney	None	Fokker	77	17	20
8.	Lt. Col. Reynolds—Lt. Bagby	Sgt. L. N. Parrish	DH-4	82	09	10
	Completed round trip but not within time limit:					
9.	1st Lt. D. B. Gish	Sgt. Pomeroy	DH-4			
10.	Capt. Felix Steinle	Sgt. H. Myhres	DH-4			

WINNERS OF SPEED TEST—FLYING TIME FROM EAST TO WEST—ALL TYPES

	Pilot	Passenger	Type of Machine	Hrs.	Time Mins.	Sec.
1.	1st Lt. Belvin W. Maynard	Sgt. W. E. Klein	DH-4	25	16	47
2.	1st Lt. H. H. George	Sgt. L. N. Parrish	DH-4	25	29	48
3.	2nd Lt. Alexander Pearson	Sgt. Royal Atkinson	DH-4	26	46	01
4.	2nd Lt. H. W. Sheridan	2nd Lt. F. W. Nelson	DH-4	28	59	53
5.	Capt. Harry Smith	Capt. T. W. Allen	DH-4	29	44	36
6.	1st Lt. G. H. Gale	2nd Lt. W. E. Richards	DH-4	29	56	09
7.	Major Edwin B. Lyon	2nd Lt. H. E. Chandler	DH-4	30	36	02
8.	Capt. John O. Donaldson	None	SE-5	31	19	44
9.	1st Lt. D. B. Gish	Sgt. Pomeroy	DH-4	32	17	46
10.	2nd Lt. L. V. Beau, Jr.	Pvt. J. J. McVeigh	DH-4	32	26	51
11.	2nd Lt. S. W. Torney	Sgt. E. R. Vanatta	DH-4	36	53	20
12.	2nd Lt. Wm. C. F. Brown	Corp. Elmer J. Robbins	DH-4	41	02	19
13.	2nd Lt. T. Hynes	2nd Lt. T. K. Mathews	DH-4	41	22	55
14.	2nd Lt. E. H. Manzelman	C.S.M. M. C. Goodnough	DH-4	44	21	14
15.	2nd Lt. J. B. Wright	Sgt. B. Coleman	DH-4	44	29	06
16.	2nd Lt. L. S. Webster	Sgt. Chas. Tindell	DH-4	46	18	27
17.	Lt. Col. T. S. Bowen	Capt. D. H. Young	DH-B	48	04	43
18.	Lt. Col. H. E. Hartney	None	Fokker	48	23	03
19.*	1st Lt. J. P. Roullot	M.E. Orville W. Haynes	DH-4	49	50	36
20.	1st Lt. R. L. Maughan	None	Spad	51	03	39
21.	Capt. Felix Steinle	Sgt. H. Myhres	DH-4	52	05	19
22.	Capt. H. C. Drayton	2nd Lt. L. J. Sweeley	DH-4	53	54	25
23.	2nd Lt. J. B. Machle	Sgt. Jesse D. McClure	DH-4	57	20	15
24.	Lt. Col. J. N. Reynolds	1st Lt. R. B. Bagby	DH-4	57	32	09
25.†	2nd Lt. Fred C. Nelson	1st Lt. Sam M. Lunt	DH-9	123	56	36
26.†	1st Lt. G. R. Newman	Capt. H. H. Page	DH-4	147	32	41

* Disqualified for not circling landing field.

† Disqualified—away from Control Stop for over 48 hours.

WINNERS FROM WEST TO EAST—ALL TYPES

	Pilot	Passenger	Type of Machine	Hrs.	Time Mins.	Sec.
1.	2nd Lt. R. S. Worthington	None	SE-5	25	23	19
2.	2nd Lt. E. C. Kiel	Sgt. F. McKee	DH-4	26	17	03
3.	Major Carl Spatz	Sgt. E. Tanner	DH-B	26	34	57
4.	1st Lt. J. P. Richter	2nd Lt. J. B. Patrick	DH-4	27	23	00
5.	Capt. L. H. Smith	1st Lt. F. W. Ruggles	DH-B	28	27	21
6.	Major J. C. P. Bartholf	None	SE-5	36	06	56
7.	2nd Lt. H. E. Queen	M.E. L. E. Bishop	DH-4	43	52	28

DISTANCES AND CONTROL STOPS

Control Stops	Time Change	Altitude	Distance between Stops E. to W.	Distance between Stops W. to E.	Miles from Start E. to W.	Miles from Start W. to E.
Mineola	Eastern	106	0	142	0	2701
Binghamton	Eastern	863	142	125	142	2559
Rochester	Eastern	513	125	56	267	2434
Buffalo	Eastern	583	56	180	323	2378
Cleveland	Central	603	180	147	503	2198
Bryan	Central	767	147	160	650	2051
Chicago	Central	593	160	155	810	1891
Rock Island	Central	563	155	158	965	1736
Des Moines	Central	805	158	118	1123	1578
Omaha	Central	1034	118	132	1241	1460
St. Paul	Central	1815	132	118	1373	1328
North Platte	Mountain	2805	118	112	1491	1210
Sidney	Mountain	4085	112	93	1603	1098
Cheyenne	Mountain	6062	93	113	1696	1005
Wolcott	Mountain	6623	113	137	1809	892
Green River	Mountain	6082	137	137	1946	755
Salt Lake City	Western	4248	137	100	2083	618
Salduro	Western	4100	100	162	2183	518
Battle Mountain	Western	4507	162	169	2345	356
Reno	Western	449	169	112	2514	187
Sacramento	Western	30	112	75	2626	75
San Francisco	Western	15	75	0	2701	0

Transcontinental Race Winners

(Continued from page 3)

WINNERS ON ELAPSED TIME—EAST TO WEST

	Pilot	Passenger	Type of Machine	Days	Hrs.	Min.	Sec.
1.	1st Lt. Belvin W. Maynard	Sgt. W. E. Klein	DH-4	3	6	48	7
2.	2nd Lt. Alexander Pearson	Sgt. Royal Atkinson	DH-4	4	4	23	—
3.	Capt. John O. Donaldson	None	SE-5	4	4	51	3
4.	Capt. H. C. Drayton	2nd Lt. L. J. Sweeley	DH-4	4	7	25	29
5.	2nd Lt. E. H. Manzelman	C.S.M. M. C. Goodnough	DH-4	4	9	35	50
6.*	Capt. Harry Smith	Capt. T. W. Allen	DH-4	4	11	28	58
7.	2nd Lt. L. S. Webster	Sgt. Chas. Tindell	DH-4	4	12	13	8
8.	Lt. Col. T. S. Bowen	Capt. D. H. Young	DH-(B)	5	5	12	54
9.	2nd Lt. H. W. Sheridan	2nd Lt. F. W. Nelson	DH-4	6	—	7	50
10.	Lt. Col. J. N. Reynolds	1st Lt. R. B. Bagby	DH-4	6	1	30	55
11.	2nd Lt. S. W. Torney	Sgt. E. R. Vanatta	DH-4	7	4	28	36
12.*	1st Lt. J. T. Roulott	M.E. Orville W. Haynes	DH-4	7	8	55	7
13.	2nd Lt. Wm. C. F. Brown	Corp. Elmer J. Robbins	DH-4	7	9	38	17
14.	Major Edwin B. Lyon	2nd Lt. H. B. Chandler	DH-4	7	23	26	35
15.	1st Lt. H. H. George	Sgt. Lee N. Parrish	DH-4	8	1	39	25
16.	2nd Lt. J. B. Wright	Sgt. B. Coleman	DH-4	8	2	49	51
17.	2nd Lt. T. Hynes	2nd Lt. T. K. Mathews	DH-4	8	3	42	17
18.	Lt. Col. H. E. Hartney	None	Fokker	8	7	35	46
19.	1st Lt. D. B. Gish	Sgt. Pomeroy	DH-4	9	1	—	57
20.	1st Lt. G. H. Gale	2nd Lt. W. E. Richards	DH-4	9	4	37	—
21.	Capt. Felix Steinle	Sgt. H. Myers	DH-4	9	6	20	—
22.	2nd Lt. L. V. Beau, Jr.	Pvt. J. J. McVeigh	DH-4	9	7	6	50
23.	1st Lt. R. L. Maughan	None	Spad	9	7	8	5
24.†	1st Lt. G. B. Newman	Capt. H. H. Page	DH-4	11	4	17	—
25.†	2nd Lt. Fred C. Nelson	1st Lt. Sam M. Lunt	DH-4	12	2	12	—
26.†	2nd Lt. J. B. Machle	Sgt. J. D. McClure	DH-4	12	5	28	—

* Disqualified for not circling landing field.

† Disqualified—away from Control Stop for over 48 hours.

WINNERS ON ELAPSED TIME—WEST TO EAST

	Pilot	Passenger	Type of Machine	Days	Hrs.	Min.	Sec.
1.	Major C. Spatz	Sgt. E. Tanner	DH-B	3	8	41	30
2.	2nd Lt. E. C. Keil	Sgt. F. McKee	DH-4	3	8	44	10
3.	Capt. L. H. Smith	1st Lt. F. W. Ruggles	DH-B	4	—	57	42
4.	2nd Lt. H. E. Queen	M.E. L. E. Bishop	DH-4	4	3	48	23
5.	2nd Lt. R. S. Worthington	None	SE-5	4	4	22	3
6.	Major J. C. P. Bartholf	None	SE-5	5	7	24	3
7.	1st Lt. J. P. Richter	2nd Lt. J. B. Patrick	DH-4	9	6	15	25

WINNERS ON ELAPSED TIME—ROUND TRIP

	Pilot	Passenger	Type of Machine	Days	Hrs.	Min.	Sec.
1.	1st Lt. Belvin W. Maynard	Sgt. W. E. Klein	DH-4	9	4	26	5
2.	Capt. John O. Donaldson	None	SE-5	10	—	15	8
3.	Capt. L. H. Smith	1st Lt. F. W. Ruggles	DH-B	11	—	51	53
4.	2nd Lt. Alexander Pearson, Jr.	Sgt. Royal Atkinson	DH-4	12	—	44	30
5.	2nd Lt. H. E. Manzelman	C.S.M. M. C. Goodnough	DH-4	12	4	13	50
6.	Lt. Col. Reynolds-Lt. Bagby	Sgt. L. N. Parrish	DH-4	20	3	33	—
7.	Lt. Col. H. E. Hartney	None	Fokker	20	6	24	—
8.	2nd Lt. R. S. Worthington	None	SE-5	20	7	14	—
	Completed round trip but not within time limit.						
9.	1st Lt. D. B. Gish	Sgt. Pomeroy	DH-4				
10.	Capt. Felix Steinle	Sgt. H. Myhres	DH-4				

regulations. In addition they will make the necessary arrangements with the Mayor, Chamber of Commerce, or some official body in each town to insure necessary protection to spectators, pilots, public and government property. He will have sufficient enlisted men ordered to report to the Commanding Officer each control stop, reaching destination on or before October 6th.

FORCED LANDINGS

6. Stops made outside control stations on account of forced landings will not be deducted. The time taken by a pilot to go from one control stop to the next, computed from wheels leaving the ground until they touch at the next succeeding control stop, will be considered the actual flying time.

SUPPLIES

7. For the information of all concerned, the Chief, Supply Group, is having the following material shipped to each field ,addressed as follows: Officer in charge Air Service Reliability Test, Care of Mayor—(City)—(State).

2000 Gal. test gasoline.
300 Gal. Motor Mineral Oil (Liberty and Mobile B)
300 Gal. Castor Oil.
3 Standard Field Mechanics Tool Kits.
3 Fire extinguishers.
Measuring cans.
Bowser Tank (when available) or 6 5-gal. cans.
3 Water cans.
3 Funnels.
100 Yards Manila Rope 1″
1 Blow torch.
1 Wind cone.
1 Medical First Aid Equipment.
50 Lbs. Lime (for marking Airdrome).
Spares for Liberty, Hispano, Motors, D. H., SE-5 and all Service planes, including spark plugs, propellers, assorted rubber hose connections, safety wire, wheels complete, dope, 1 yd. fabric.

REPAIRS

8. Repairs made at any stop must be recorded in the log book, but there will be no penalties. Every care should be taken to insure that a notation is made on the slightest adjustment or repair that has to be made during the trip. A contestant who is obliged to remain at a stop for more than 48 hours for any other reason than on account of weather will be withdrawn from the contest.

INSPECTIONS

9. Pilots will be held responsible that any defect in machine or motor is brought to the attention of the mechanics and commanding officer at the control stop, and it shall be within the power of the control stop commander to hold any machine or pilot on the ground until repairs are made to the satisfaction of the control stop commander.

CONTESTANTS' LOG BOOKS

10. Log books, containing a copy of these rules and regulations, will be issued to each pilot, in which must be carefully entered each stop, and carried along with the pilot in his flight.

FIELD LOG BOOKS

11. A field log book will be kept at each control stop, under the direct supervision of the commanding officer. In it will be kept a duplicate of every entry and memorandum in the pilots' books.

ENTRY BLANK

12. There will be no formal entry blank. Pilots will merely apply to their Commanding Officer in writing in the usual manner, and upon approval, orders will issue in due course, directing the contestant to report with his machine to the nearest starting point on October 7th.

TIME-KEEPING

13. Greatest care must be exercised in keeping time. Stop watches and chronometers will be used at the control stops. A pilot will be permitted to touch his wheels and go around again, the time being taken from the moment his wheels first touch.

CIRCLING OF FIELDS

14. On taking-off, a pilot need not circle the field, but he must not leave for his destination until he has satisfied himself that his motor is working perfectly. On landing, pilot will be compelled to circle the field once to insure the direction of wind and the terrain of the field. Failure to circle the field before landing will disqualify the contestant.

RATINGS

15. There will be three competitions each way, and contestants will be rated in order of merit in each.

(a) **Time Competition:** First place in this report awarded to the pilot crossing the continent in the shortest time, irrespective of stops and actual flying time.

(b) **Speed Contest:** In this competition there will be as many classes as there are types of machines. First, second and third places in each class will be awarded to the pilot in order respectively having the shortest actual flying time.

(c) **Handicap Competition:** This will be based on actual flying time, but each class (type of machine) will be given a handicap percentage based upon its reputed speed as computed by the Technical Section in their official tests.

(Continued on page 14)

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Government Again Leases M. I. T. Wind Tunnel

Interest in the Plan to Raise $10,000,000 Endowment Fund Is Greatly Intensified

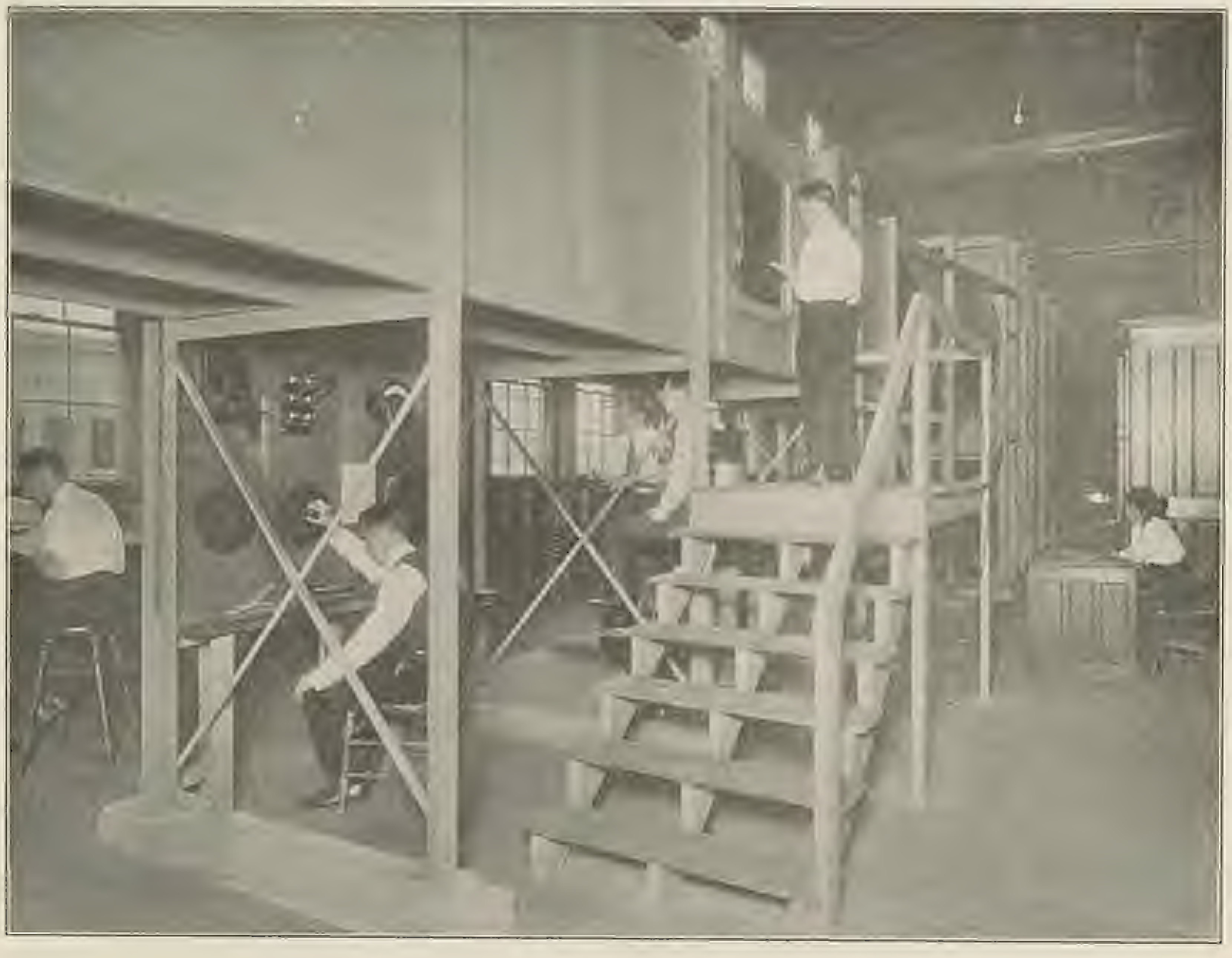
One of the few wind tunnels for testing models of aeroplanes in the United States is in the laboratory of the Aeronautical Engineering Department at the Massachusetts Institute of Technology. The M. I. T. has always been in the vanguard of scientific progress, and as early as the "nineties" Tech established its first wind tunnel, a very modest affair with a conduit two feet square and the possibility of a wind through it of twelve miles an hour. This was used for experiments in air currents and some research with reference to the form of air propellers. It is interesting to note that in 1912 ten of the graduates at the M. I. T. chose for their thesis subjects some phase of the aviation problem.

In 1913 Dr. Maclaurin, the president of the institute, suggested to the Secretary of the Navy that a course in aerodynamics be included in the postgraduate school of Naval Architecture, which was given by the institute for all naval constructors who graduated from Annapolis. This suggestion was adopted by the Navy, and Commander J. C. Hunsaker was detailed to visit the aeronautic centers of instruction and laboratories in Europe. Upon his return he became instructor in aeronautical engineering at the institute. The course in aeronautical engineering had, then, its formal opening in 1914.

The war brought about rapid development both in the scope of the work in aerodynamics and in the interest of the technical student in that branch of engineering. To-day the institute has a flourishing Aero Club of nearly one hundred members, all of whom are actively interested in aeronautics. The management has arranged a series of smokers with noted aeronautical engineers as speakers.

The club is made up mostly of undergraduates, but up to the present time the course in aeronautical engineering has been open only to graduate students. At a recent meeting the club voted to petition the faculty for an undergraduate course in aeronautics. The faculty is anxious to develop such a course at Technology, and it is for that and kindred purposes that the alumni and friends of the institute are starting a campaign for a $10,000,000 endowment fund. A friend of the institute, who is known as "Mr. Smith," has promised the M. I. T. $4,000,000 if the alumni of the college will raise a like sum before the end of the year. "Mr. Smith" has already given Technology $7,000,000, and has promised that upon the successful outcome of the present campaign he will reveal his name.

The photograph printed herewith shows a test of a model airplane being conducted in the wind channel of the Massachusetts Institute of Technology, Department of Aeronautics.



TESTING A MODEL IN THE WIND CHANNEL OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

The channel is the long tube, 4' square, shown in the photograph, through which an artificial wind is blowing on a tiny model which is one-twentyfourth as large as a regular airplane and made accurately to scale allowing for an error of one-two hundredths of an inch.

The man in the lower left has his hand on the switch which regulates the speed of the "wind"; the man at the head of the steps is looking through a glass plate at the model of the little airplane.

The two men are located directly beneath the tunnel where they read and adjust the aerodynamical balance.

The government has just renewed the lease of the wind tunnel.

ANSWERS TO CORRESPONDENTS

Inquiries on aeronautical or allied subjects will gladly be answered by the editors of AIRCRAFT JOURNAL by letter to the inquirer and included in these columns. Questions to be answered by mail should be accomplished by stamped addressed envelopes.

Inquiry:—Can you state who the first fifteen American Aces were in Europe during the war, and are they all yet living. Who is Roy N. Francis? Have Bishop and Rickenbacker written books and if so where can they be purchased? What does Jn stand for,—what words? Also VE and TM-S4C? Why do the British use some four-bladed air screws, while we hold entirely to two blades?

A. C. H.—The first fifteen American fliers in Europe and their number of victories are as follows:

1.	Captain Edward Rickenbacker	25	
2.	2nd Lt. Frank Luke	18	Dead
3.	Major R. V. Lufbery	17	Dead
4.	1st Lt. G. A. Vaughn, Jr.	13	
5.	1st Lt. David E. Putnam	12	Dead
6.	1st Lt. Fred Kindley	12	
7.	Capt. E. W. Springs	11	
8.	1st Lt. J. M. Schwab	10	
9.	Capt. Reed G. Landis	10	[redacted]
10.	1st Lt. C. E. Wright	9	
11.	1st Lt. T. G. Cassidy	9	
12.	1st Lt. P. F. Baer	9	
13.	1st Lt. H. R. Clay	8	
14.	Major G. A. Meissner	8	
15.	Capt. Hamilton Coolidge	8	Dead

Roy N. Francis is a temporary Captain in the Air Service and one of the earliest fliers in the country. He has probably had as many hours in the air as any American pilot.

Rickenbacker has written a book entitled "Fighting the Flying Circus," which is published by the F. A. Stokes Co., at 445 Fourth Avenue, N. Y.

The letters JN refer to a continuation of the model J features and the model N characteristics, both models being early types in Curtiss development.

VE stands for Vought Experimental. TM-S4C stands for Thomas Morse, the S4C showing that it is the fourth Scout type of machine which has been prepared for manufacture, the letter C standing for the third modified machine of the S-4 type.

The British sometimes use two-bladed, sometimes four-bladed airscrews. This depends on characteristics of design. With a four-bladed screw, it is possible to obtain required thrust with smaller diameter, which may be necessary to give propeller ground clearance.

Inquiry:—In the issue of Aircraft Journal for April 19, there is a picture of a small single seater aeroplane. Will you please tell me the wing curve that would be used in a plane of this type and give me a description of it? Also, would this plane fly with any less than 45 horse-power? Could this plane carry two passengers if the wing area were increased enough to keep the loading the same?

F. S.—This machine has never been built and is merely a suggestion for design. A suitable wing curve would be the R. A. F. 6. This plane can certainly fly with a little less than 45 h.p., but that would diminish the qualities of the design. It certainly might be possible to increase the wing area to carry two passengers, but this might necessitate change in wing trussing as unsupported span of upper wings might become too large.

Inquiry—I would like to know the address of Crosby Lockwood and Son in London, and Iliffe and Sons, Ltd., in London, whose reviews appear very often in Aviation and Aeronautical Engineering. I would like also to get some British and French magazines, and shall appreciate any information you give me about it, as well as about complete text of British Advisory Committee.

B. V. K.—Crosby Lockwood & Son are located at 7 Stationers' Hall Court, London, E. C., and Iliffe and Sons, Ltd., are at 20 Tudor Street, London, E. C. 4. British and French magazines can be obtained from the International News Company, 83 Duane Street, New York City.

Inquiry—What are the Government regulations for civilian flying? Is it necessary to obtain a flying license in order to fly? What steps are necessary to get such a flying license for one who has been an Army pilot?

J. A. P.—The President has rescinded the proclamation requiring a license for civilian flying, and at the present moment no license is required. As a former Army pilot, you are well situated for flying.

WINTER HANGARS

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Formerly Air Service Journal

Congressional Opinion

FOLLOWING is a digest of remarks made by members of the House of Representatives concerning congressional action on the United States Air Service:

KLECZKA, JOHN C., Wisconsin: "I believe sufficient appropriations should be made at once for adequate development and maintenance of the (air) service. Based on the knowledge I have of this subject up to the present time, my judgment is that more efficiency and better results could be obtained by the establishment and maintenance of an independent and separate department of the U. S. air service."

RAINEY, HENRY T., Illinois: "I have great confidence in the future of air navigation. This great government ought to keep abreast of the times and ought to order airplanes now. I will gladly support any appropriation sufficient for that purpose. It does not appear to me that it is necessary as yet to make the air service a separate department."

ROMJUE, M. A., Missouri: "I believe a thoroughly developed air service is needed by our government as it is destined to play a very important part in the future protection of our country and I am of the opinion that a separate air service would obtain much better results than to have it under the jurisdiction and subject to the orders of another department or branch of our government."

WOOD, WILL R., Indiana: "I am in favor of a liberal appropriation for this service and have no doubt that eventually it will be made. I trust that before this service is crippled a definite program may be agreed upon."

CRAGO, THOMAS S., Pennsylvania: "I do not believe that the service is at all handicapped by any lack of appropriation. They may be handicapped in going ahead the right way by reason of the lack of legislation. I am disposed to agree with the idea advanced by General Pershing and I think this will be adopted, namely, a separate air service which will have charge of research, experimental, development, and production for all branches of the government service; I believe it will be it will be very easy matter to secure the necessary appropriation to carry on this work."

CLARK, FRANK, Florida: "I am of the opinion that we should have a single department, and am in favor of the government keeping up this department so that we may be abreast if not in advance of the other countries."

WILSON, RILEY J., Louisiana: "I favor the development of our aviation to a point where it is comparable with that of the other powers."

IRELAND, CLIFFORD, Illinois: "I feel that every effort should be made to uphold the air services of the United States Navy and Army. If this can better be accomplished by a separate air service, then it should be done in that manner. We should not overlook the commercial end of the game. I feel that if the commercial end of aviation is thoroughly developed, it is bound to carry with it development of aircraft for Army and Navy purposes."

AYRES, W. A., Kansas: "I want the air service kept up to date, and improve it, but I am not yet ready to say just how far we should go."

DAVY, MARTIN L., Ohio: "I am fully committed to the proposition of proper development of the air service, including of course adequate and timely appropriations. I am ready to support an emergency appropriation and a reasonably generous yearly appropriation. My present judgment favors a separate department."

LEA, CLARENCE F., California: "I believe that appropriations materially larger than those authorized by Congress are necessary for the air service and I believe it is not economy to withhold them. I see much in a separate air service from the standpoint of production to commend it. A separate air service from the standpoint of operations is much more questionable, although I am not fully prepared to commit myself as to decided views upon that question."

EVANS, C. R., Nevada: "My desire is that aeronautics have a greater substantial recognition under the direction and control of the War Department."

WELTY, B. F., Ohio: "I believe the future of our country depends upon the air service. I want an air service which will make it impossible for another country to attack us successfully either by land or water. Just whether this can be accomplished by having a single department I know not, but this branch of the service during the war must necessarily be attached to or under the direction of either the War or Navy Department."

BARBOUR, HENRY E., California: "I am in favor of making the U. S. Air Service second to none."

SABATH, ADOLPH J., Illinois: "I have not had the time and opportunity to study the airplane situation and do not know whether it would be best to have a separate branch or bureau of this line of service. I am not in favor of assembling a large number of airplanes which at best will last only a few years, but do believe in having the necessary supplies in readiness to continue the improvement of such airplanes as the needs of the service may require.."

GARAND, MAKLON M., Pennsylvania: "I accept Mr. LaGuardia's opinion on this subject as he has had considerable actual experience in the air service during the war and he is much interested in establishing a proper Department for this service with the necessary appropriation."

CALDWELL, CHARLES POPE, New York: "I was the father of the $640,000,000 Air Service appropriation bill and have worked actively and consistently for both Army and Navy air service expansion."

SIMS, THETUS W., Tennessee: "I have no opinion as to what is best to be done about the air service."

JONSON, ROYAL C., South Dakota: "Mr. Johnson has always been in favor of a strong air service and has voted accordingly."

YOUNG, GEORGE M., North Dakota: "I am greatly interested in the developing of our air service which I believe to be highly desirable."

KAHN, JULIUS, California: "I am greatly interested in the aerial defense of the U. S. I hope as chairman of Committee on Military Affairs to work out a permanent military policy which will be satisfactory to the whole country."

KIESS EDGAR R., Pennsylvania: "Glad to have information on the status of the air service."

CLARK, CHAMP, Missouri: "I certainly favor an adequate appropriation for the air service but do not favor a separate department. People are very dubious about the $640,000,000 wasted or embezzled."

DENT, S. HUBERT, Jr., Alabama: "I am heatily in favor of developing the air service and will be glad to do any and everything that I can do to that end."

Alcohol As Fuel for Internal Combustion Engines

Practical Applications in England and Germany Have Demonstrated Its Efficiency

It has been adequately proved in Europe that alcohol, without the addition of any substance aside from that necessary for denaturing purposes, can be used, efficiently and economically in internal combustion engines. Alcohol had long been considered as a fuel for motors, but its practical application has only recently been demonstrated.

The immense excess production of potatoes in Germany, encouraged by the Government on idle land, was converted into starch and alcohol. This production grew to such an extent that it was necessary to find new outlets. Considerable prizes were offered for the best internal combustion engine employing alcohol as fuel, and large quantities of this liquid were placed on the market at surprisingly low prices.

Considerable enthusiasm followed, and several very efficient engines were exhibited, mostly slow-running, high compression motors of from 2 to 20 horse-power. It was found that the greatest efficiency was obtained when the cooling water was kept as near the boiling point as possible, and, owing to the high latent heat of evaporation of alcohol, the air supply to the carburetor was highly heated. Absence of corrosion in these motors was very noticeable, and the cleanliness of the cylinders was remarkable.

The requirements of the modern aviation motor are much more difficult to meet that those of the comparatively slow-running engines referred to above.

The modern high-speed motor will run on alcohol alone if sufficient hot air is supplied to the carburetor, but the fuel consumption is very great, and the power decreases rapidly from about 1,000 R.P.M. Since the average airplane motor is designed to run at between 1,400 and 1,600 R.P.M., it can be readily seen that to attempt to use pure alcohol would be impractical. Therefore, for maximum efficiency and minimum cost, it is necessary to use alcohol which will supply the physical properties in which the alcohol itself is deficient.

Although the relative heat values of methylated spirits is lower than either gasoline or benzol, it can be used at a much higher compression, producing a thermal efficiency which makes up for the lower heat value. Owing to this high thermal efficiency, obtained when running on alcohol, more power can be developed with this fuel than with gasoline.

For present day use alcohol must be combined with some substance, which will enable the mixture to be employed in existing engines with little or no changes in design, except as may be necessary toward warming the air supply or weighing the carburetor float. For this purpose benzol or ether may be used.

Equal parts of alcohol and benzol on a test of a Maudslay engine, were found to give 1 per cent less power, and used 3.7 per cent less fuel than when running on gasoline. The thermal efficiency of the gasoline on this test was 20.8 with the motor running between 700 and 1,100 R.P.M.; while the alcohol-benzol mixture gave 25 per cent, but the decrease in power at the higher speed was more rapid with alcohol than with gasoline.

At first, considerable difficulty was experienced in starting, but it was found that with the addition of about 40 per cent ethyl ether this difficulty was entirely overcome.

It is interesting to note that for every pound of gasoline which is burned, 0.7 per cent has to be employed to bring about evaporation in the carburetor. With benzol 1.04 per cent is employed in evaporation, and 4.17 per cent of alcohol is required for evaporative purposes. It is possible, however, to obtain sufficient heat from the exhaust and cooling water to provide all the necessary thermal units necessary for the evaporation of the alcohol, without wasting the fuel itself.

A few tests made on a Sunbeam engine with slight carburetor changes—the addition of an air supply heating device and valve arrangements to allow 2,000 R.P.M.—showed that with a 50 per cent alcohol and benzol solution this motor developed more power than could be obtained at any speed with gasoline. The good results were due to the high compression obtained with the use of larger valves. In this test, the alcohol mixture consumption was slightly greater than that of the gasoline.

It is certain, that, with a little experimenting on alcohol carburetors, this fuel can be used on existing engines with a decided increase in power and no increase in consumption.—*London Times.*

LIEUT. M. B. MAYNARD AND SGT. W. E. KLEIN, ACCOMPANIED BY THEIR MASCOT, "TRIXIE," TAKEN JUST BEFORE THE TRANSCONTINENTAL FLIGHT

(c) Underwood & Underwood

IMPORTS BY AIR

An interesting sign of the times is to be found in the London customs bill of entry, which now contains in its imports columns details concerning goods brought into Great Britain by air.

A recent issue announces the fact that the Handley Page Transport Co., Ltd., have imported from France quantities of silk, fancy goods, ladies' hats and embroidery.

These commodities were carried from Paris to Hounslow by the two engined Handley Page airplanes engaged on the cross channel service.

Japan to Spend $125,000,000

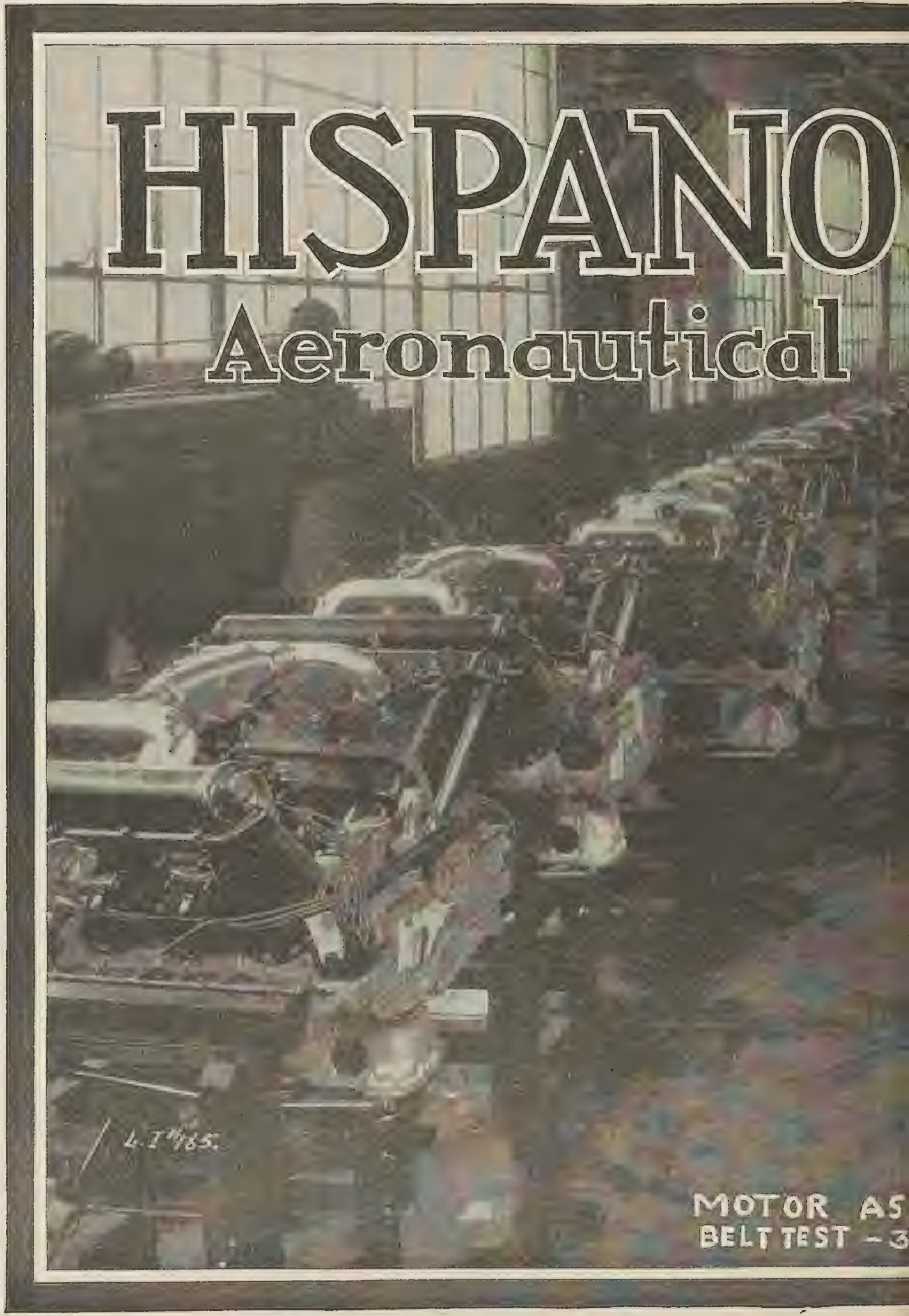
An Associated Press cablegram from Tokio says: The Japanese Government is preparing to appropriate the equivalent of $125,000,000 for the development of aviation, in which she is backward, the amount to be expended over four or five years.

Interest in aviation has been stimulated here by the special French aviation corps which is teaching the Japanese Army.

RAUSIE E-6

A six-cylinder aviation engine, designed and developed by L. E. Rausenberger, who is connected with The Steel Products Engineering Company of Springfield, Ohio, as aeronautical engineers, is about to be placed on the market.

It is to be known as the "Rausie E-6," and will be manufactured by The Steel Products Engineering Co.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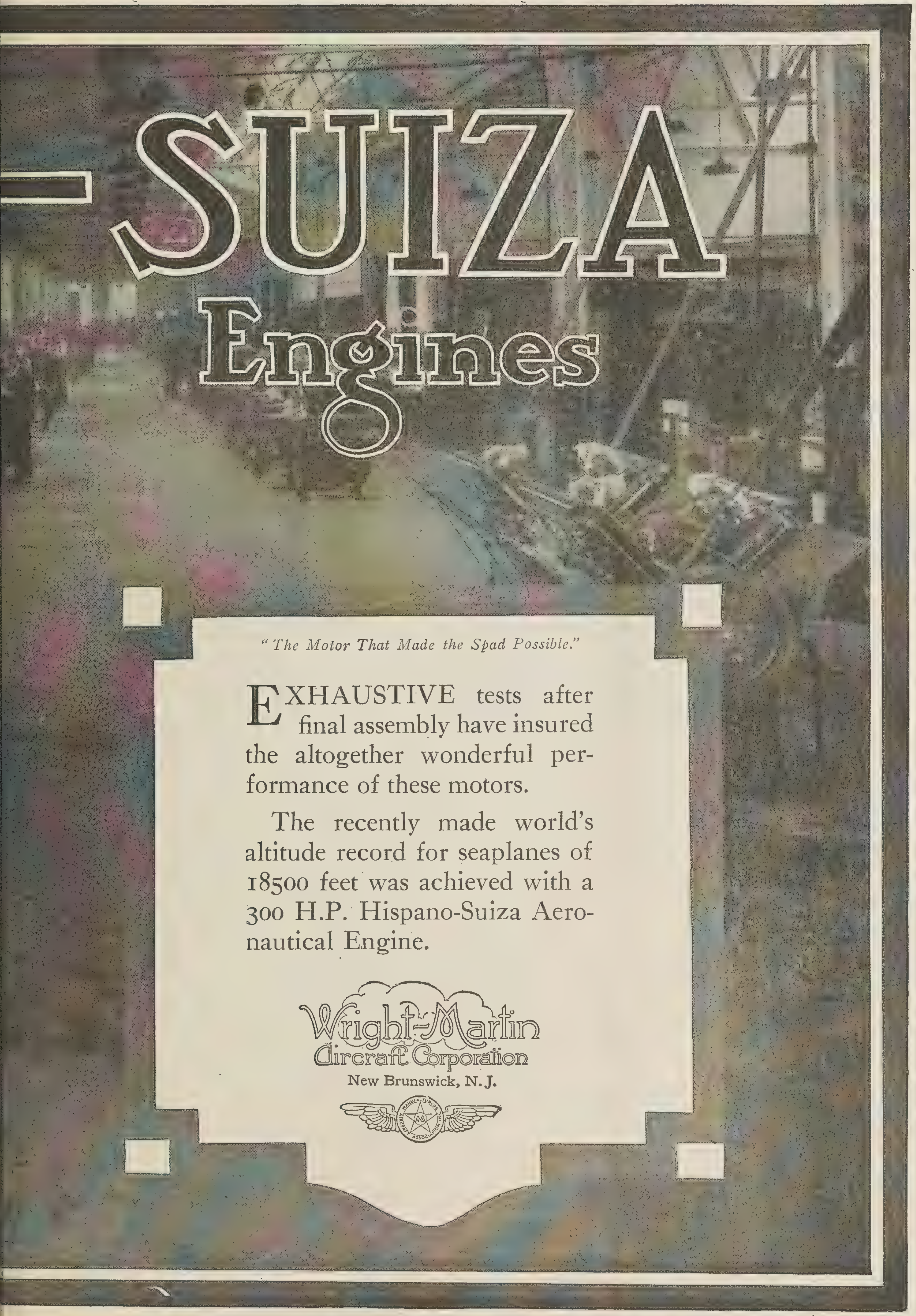


"The Motor That Made the Spad Possible."

EXHAUSTIVE tests after final assembly have insured the altogether wonderful performance of these motors.

The recently made world's altitude record for seaplanes of 18500 feet was achieved with a 300 H.P. Hispano-Suiza Aeronautical Engine.

Wright-Martin
Aircraft Corporation
New Brunswick, N. J.

Progress of Air Navigation in France

System of Coordination with Assistance From the Government Already Assured

(*Translation of an article in the "Petit Parisien"*)

There are two enemies to the development of aerial navigation in France. They are the pessimists, who pretend that "nothing is ever done here in France," and the publicity given to aviation accidents.

The former can easily be met with a reply at the present time, and the regularity of aerial navigation services will very soon provide sufficient proof that accidents are rare and exceptional.

The system of general aeronautical co-ordination recently created has three branches of execution at its disposal: the Service of Manufactures, through which all orders for airplanes must be passed; the Services of Study, and the Service of Aerial Navigation.

The latter Department consists of specialists,—civilian and military technicians,—under the direction of Lieutenant-Colonel Sacconey. It has become quite distinct from the central organization, and makes a special point of creating air routes and of developing aerial navigation.

With this end in view, the Service is organizing a net-like system of aerial ports, so devised that an aerial navigator can always be sure of finding landing-places, shelters and repair workshops. A system of this kind could not be improvised. Grounds of sufficient extent must be secured, and laid out with hangar installations. A meteorological and wireless telegraph system would, moreover, enable the establishment of communication between ground posts and aerial passengers. In order to ensure the working of such system, the State is now allotting quite a service of personnel to each port. Organizations of this kind should be carried out with the aid of those municipalities and departments which have interest in attracting aerial travellers to their regions.

The State is prepared to give financial support to any aerial navigation undertaking doing effective work of public interest. Such support would naturally be more considerable in the case of long-distance travellers than for tourists. The result aimed at is that of lowering the cost of goods carriage and thus making it accessible to the public.

The System of Premiums

An entire system of premiums has been taken into consideration. The price of the airplanes would be taken up, to begin with. Premiums would then be awarded to the crews in proportion to the duration of stages without landing and to the motive force to be maintained by the mechanician. Other premiums will be awarded for the regular transportation of passengers and goods, proportionate to the speed of the machine, the amount of tonnage carried and, the interest attached to the line being followed. There will, in fact, be National, International and Colonial lines, among which those penetrating the heart of Africa will be by far the most interesting.

Airplanes directly devoted to military utilization would, finally, be subsidized, that is to say, machines showing special characteristics of horizontal flight and in climbing. The premium would be of less importance in the latter case, the commercial airplane being the object of special favor in its capacity for adaptation to military requirements, not the military airplane from the viewpoint of its commercial utility.

The prizes will be distributed to any aviator rendering services of interest to the public, without there being the least obligation on his part as regards doing anything for the State.

No Line Will Be Exploited by the Government

In the event of the organization of Governmental transportation lines, such as mails or parcel-post, an assignment will be made among the competing contractors for the award corresponding to such transportation.

LIEUT.W.R. TAYLOR, WHO ASSEMBLED HIS OWN MACHINE WHEN HE FOUND NONE READY FOR HIM FOR USE IN THE TRANSCONTINENTAL RACE

[C] *U. & U.*

It has been established, as an absolute principle, that no aerial transportation line shall be exploited by the Government, all such exploitation being undertaken by private parties. There are, up to date, no aerial postal services now in the hands of the military authorities.

It should be possible to give an exact estimate of the net cost of such transportation by considering the net cost of the airplane per kilometer. It now amounts to 5 to 6 francs for an airplane with carrying capacity of 500 Kilos, and 10 to 12 francs in the case of a machine with capacity for two tons.

For the former airplane, the net price of the useful ton, per kilometer, will be from 10 to 12 francs; in the case of the second, it will naturally be from 5 to 6 francs.

These prices are really higher than they should be, owing to the very heavy expenses of the present time, which are due, in their turn, to the practically prohibitive rates of insurance, and also to the fact only one line is exploited, at present, by the various companies engaged in aerial transportation.

It is highly probable that if there is continuous development on the part of the Aerial Companies and of the system of lines, the tariff of heavy freight airplanes will drop to 4 francs.

Attention should be called to the fact that the latter price is barely double that of the kilometric ton transported by camion, while the speed, in the case of the airplane, would be five times as high.

The above-quoted figures give unmistakable proof of the future in store for aerial transportation, but only on condition that the full amount of freight be carried by the airplane. It is for this very reason that the Government, desirous of guarding the Companies against certain ruin at the outset, is seeking a means of support to bring to their assistance.

Commercial Aviation is a Reserve

The Government has several reasons for maintaining the activity of Aeronautical Industry. Commercial aerial navigation is the normal issue of aeronautical industry now that the output provided by the War has ceased to exist. Such industry is, however, a prime factor of our National Defense, and its activity should therefore be maintained on a footing, in time of Peace, which might speedily be worked up to concentrated and high-pressure manufacture in time of War.

In developing aerial travelling, the Government would also find reserves of pilots and mechanicians in a thorough state of preparedness. This would do away with the necessity for mobilizing the necessary working staff, and would thereby represent so much gain to National production.

Transportation airplanes would in themselves comprise a sufficient airplane reserve, with the military aptitude necessary to meet the demands of warfare.

Lastly, such airplanes would provide an excellent means of promoting exportation and thereby extending our trade in foreign countries.

Responsibilities of Aerial Companies

Aerial Transportation Companies subsidized by the Government would have, on their part, obligations to fulfil. They would have to insure a certain number of machines, which would be thoroughly overhauled and examined and would thus provide a guarantee for the safety of the passengers.

The same principle would be applied to the pilots, who would have to pass periodical examinations and tests.

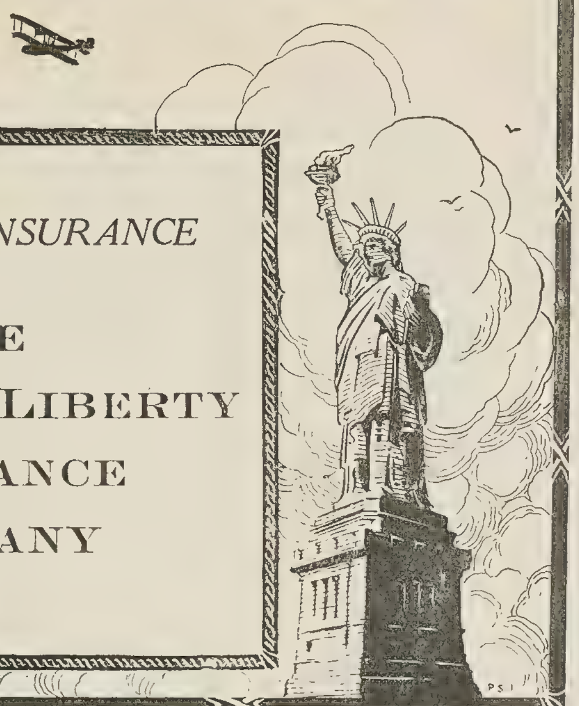
In addition to all this, scales of maximum tariffs would be drawn up to avoid the possibility of opposition, on the part of the contractors, to the object to be attained, which is, as before mentioned, a reduction in the present cost of aerial transportation.

That Which Has Been Done

There is a vast scope for ambition in aerial transportation, and such ambition is justifiable. The first question at stake is that of establishing communication between France, North Africa, Dakar and South America by means of dirigibles and airplanes.

With this object, the former programs of the Navy have been resumed, and *rigid dirigibles have already been ordered*, as also hangars and shipyards.

(Continued on Page 16)



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There will be offered for sale by OPEN SALES AT APPRAISED PRICES at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., the following aeronautical equipment at the prices stated each.

69	HS-2-L Flying boats	$6,160.00	Brooklyn, N. Y.
26	Sets spare parts for HS-2-L	1,500.00	"
72	Handling trucks for HS-2-L	200.00	"
46	H-16 Flying boats	11,053.00	Philadelphia, Pa.
46	Handling trucks for H-16	300.00	"
20	F-5-L Flying boats	12,400.00	"
20	Handling trucks for F-5-L	300.00	"
68	Aeromarine type 39-B seaplanes	3,000.00	Gloucester, N. J.
10	Sets spare parts for 39-B seaplanes	2,500.00	"
14	Handling trucks for 39-B	75.00	"
10	Aero Model 40 Flying boats	4,000.00	Hampton Roads, Va.
1	Seaplane JN type twin engine	2,000.00	Philadelphia, Pa.
1	Aeromarine type 39-A seaplane	1,500.50	Gloucester, N. J.
245	Curtiss OXX-6 Engines (new)	1,207.50	"
	5 OXX-6 Engines (used)	690.—1,035.00	"
13	Curtiss OX-2 Engines 90 HP	1,035.00	"
3	Curtiss OX-5 Engines 90 HP	1,035.00	"
13	Curtiss OXX-3 Engines 100 HP	690.—1,035.00	"
2	Hall-Scott engines 100 HP	1,150.00	"
12	Gnome engines 100 HP (new)	1,500.00	"
20	Gnome engines 100 HP (used)	900.00	"
2	Salmson-Hydro-Glycier engines 220 HP (used)		
7	Salmson-Hydro-Glycier engines 220 HP (used)		
	Type A-9 (Direct drive)	175.00	"
	Type A-2-C (Chain drive)	175.00	"
1	Boeing Tractor seaplane	1,500.00	"

Appraised value of used motors depends upon number of hours flying time. Most of this equipment is new and in excellent condition; many of the planes have never been uncrated.

The above equipment is stored at the Fleet Supply Base, South Brooklyn, N. Y., Naval Aircraft Factory, Philadelphia, Pa., Naval Aircraft Storehouse, Gloucester, N. J., Naval Air Station, Hampton Roads, Va., and Naval Operating Base, Hampton Roads, Va. The notation opposite the items gives location where stored. Prices are f.o.b. point of storage.

Sales will be made subject to prior sale and approval. The quantities and appraised values are subject to change without notice.

Applications to purchase any of the above equipment should be made to the Salvage Section, Bureau of Supplies and Accounts, accompanied by deposit for 5 per cent. of the amount bid. Effort will be made to make awards in the order in which offers are received.

Inspection is invited and may be arranged for with the Supply Officer of the above Naval Stations. Schedules of Sale giving full description and complete data as to terms of sale are obtainable from the above officers or from the Salvage Section, Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

JOSEPHUS DANIELS,
Secretary of the Navy.

10-6-19

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Rates, 25 cents per agate line per insertion. Black face type, 50 cents per agate line. Forms close Saturday preceding date of publication.

Demobilized R. A. F. officer and pilot, with 12 Huns to credit; winner of "Distinguished Flying Cross" and other medals; 1200 flying hours on 24 different types of machines; 500 hours on active service in France. Willing to make Trans-Pacific flight. Anxious to get into commercial aviation. Open to any reasonable proposition. Address: Aviator, Fayetteville, N. Y.

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Our firmly established Flying School will continue during the fall and winter.

We give thorough training in all branches of flying and qualify students for pilot's licenses.

Our rates are as low as they can be made, consisting with the training we give. There is no charge for breakage. Write us for particulars.

We do commercial and exhibition flying.

Address all communications to

Philadelphia-Aero Service Corporation
636 Real Estate Trust Building, PHILADELPHIA

Transcontinental Race Winners

(Continued from page 4)

MACHINES

16. Every airplane and motor must be standard productions specification in every detail. Any machine altered and varied from the specifications will be disqualified, but nothing in these rules will be construed as giving a commanding officer of any control stop authority to stop a machine from proceeding except weather and possibility of accident.

METEOROLOGICAL REPORTS

17. Aviation forecast zone maps will be forwarded to each landing field and placed in a conspicuous place for the benefit of the flyers. It will be the duty of the control officer at each field to give full reports of the weather to each pilot at the time of handling his log book, and it will be also the duty of each pilot to question the control officer at each landing field regarding the condition of the weather ahead of him in order to be sure that he meets with no weather conditions of a dangerous nature. Weather forecasts will be wired to each landing field twice daily giving the forecast for twenty-four (24) hours in advance.

REPORTS

18. The following reports will be submitted daily:

(1) Telegraphic report from each control stop to the Director of Air Service attention All Groups, with a copy to Department Air Service Officer concerned, in the following code:

A. Number of machines on hand.
B. Individual designated numbers of these ships.
C. Individual numbers of machines arriving during day, with exact local time of arrival and departure.
D. Individual numbers of machines which did not depart.
E. Complete crashes in vicinity.
F. Crashes in vicinity repairable within 48 hours.
G. Other information of interest.

(2) A telegram from each field to the next will be sent, stating time of departure of machine for that station.

(3) Emergency telegram to both adjacent fields, should weather be dangerous for flying.

(4) Written report to Director of Air Service, with copy to Department Air Service Officer concerned, inclosing copy of field log book and giving all particulars in detail.

FLYING LIMITATIONS

19. There will be no night or Sunday flying.

RETURN JOURNEY

20. Pilots who complete the race will report to the Commanding Officer and await for their instructions as to the return trip.

PROTESTS

21. Protests will be prepared by any officer observing violations of these rules, and will be addressed to the Director of Air Service, attention Chief, Training and Operations Group, stating the nature and circumstances of the violation in detail, name of witnesses and any other material evidence.

LOAD

22. All machines must leave fields with gas tank full, two-seater machines must carry a passenger, and each machine will carry small kit of spare plugs with convenient tools.

(Signed) WM. MITCHELL,
Brig. General, U. S. A.,
Chief, Training & Operations Group.
By: W. C. SHERMAN,
Lt. Colonel, Air Service,
Actg. Assistant.

NEW R. M. A.'s

The following named officers having completed the required number of tests, are rated as Reserve Military Aviators: 1st Lieut. Daniel L. Dwyer, A. S. A.; Capt. Miller Robert Taylor, A. S. A.; Capt. Gordon F. Willey, M. C.; Capt. Fred G. Rand, Chaplain; 1st Lieut. John A. MacDonald, A. S. A.; 2nd Lieut. Rosenham Beam, Field Artillery (Attached); 2nd Lieut. Norman L. Roddy, A. S. A., and 2nd Lieut. David G. Lingle, A. S. A.

Thomas F. Egan, formerly Second Lieutenant, Air Service, Aeronautics, having completed the required tests before the date of his separation from the service by honorable discharge, August 22, 1919, is rated as a Reserve Military Aviator to date from August 19, 1919.

Major William H. Saunders, Junior Military Aviator, Air Service Aeronautics, having completed the required tests, is hereby rated as an Aerial Observer to date from October 20, 1917.

FOR RESERVE OFFICERS

Attention is called to the fact that Officers of the Aviation Section, Signal Officers Reserve Corps, have been authorized to wear the insignia now worn by Officers of the Air Service in addition to the letters "U. S." with superimposed "R."

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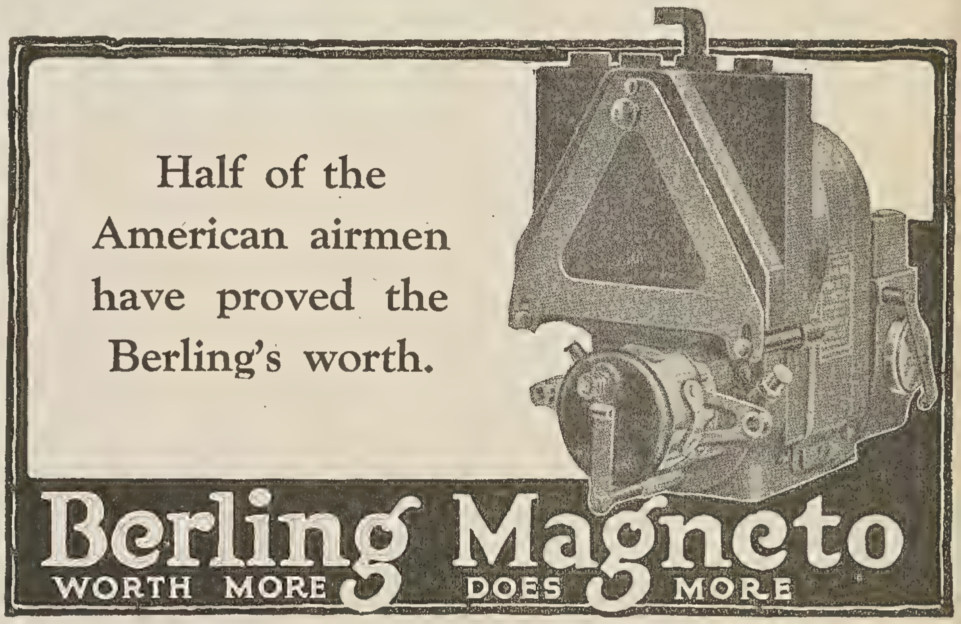
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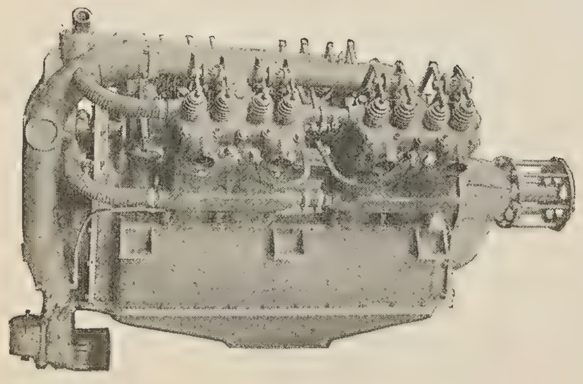
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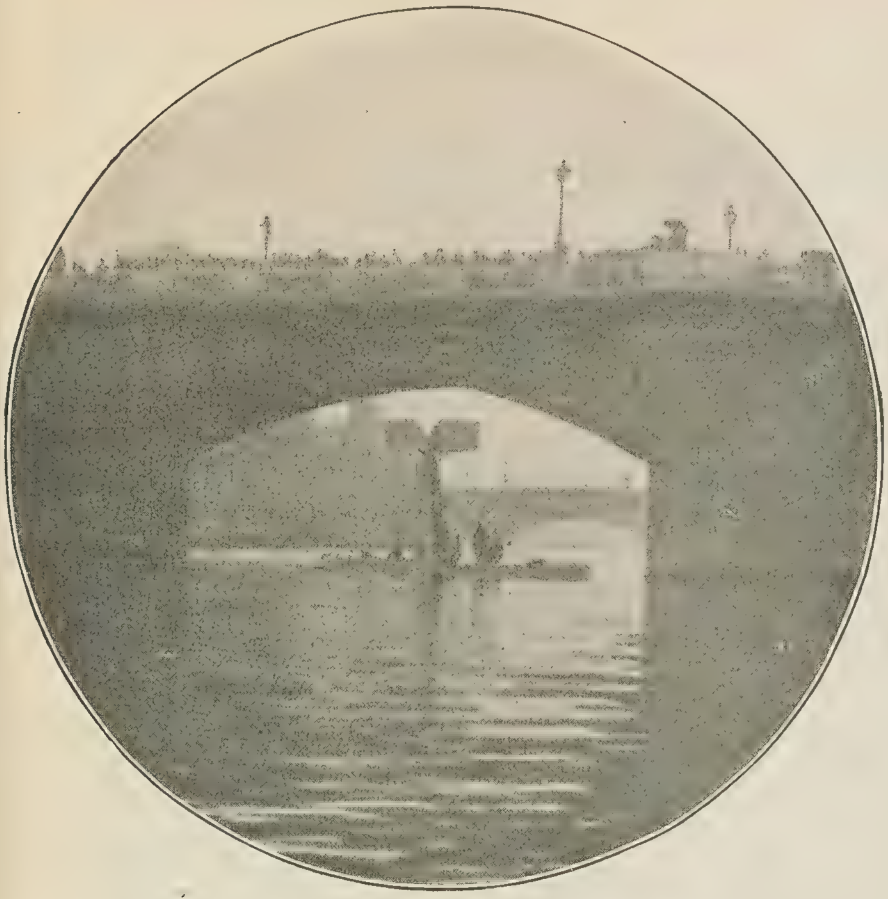

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Progress of French Air Navigation

(Continued from page 12)

Lines of communication will be established between France and the adjacent countries, to avoid the possibility of our being anticipated by other Governments.

Transversal lines will be established in France, running from East to West; the Bordeaux—Nice, Nancy—Bordeaux and many other lines are to be started, and the commerce of our frontier will thus be drained, towards the Atlantic.

Their establishment will remedy the inconveniences of our railway-network system, as centralized in Paris, and will be a response to the wishes of our Boards of Commerce, to whom the aerial system is of prime economical importance.

The question then arises: When will this attractive program be put into realization? Much optimism is shown in official circles; we have been told that part of the system will be constructed within six months, and that it will be very nearly finished towards the end of next spring.

The companies are ready; they are already being assisted. And such information as we have been able to gather admits of every hope of practical results.

Hollister Adds Planes

L T. Hollister, one of the best known insurance men in New York having specialized in automobile and commercial car insurance for the past fourteen years, has just added airplane insurance to his service and is shown in the accompanying illustration taking a trip in an airplane, inspecting same and finding out certain features which will be necessary.

Mr. Hollister states that he not only employs experts on motor trucks, trailers and passenger cars, but that he has added a crew of airplane experts to his force and is able to give his clients as good service in airplanes as he has given on automobiles.

L. T. HOLLISTER READY FOR A TRIP

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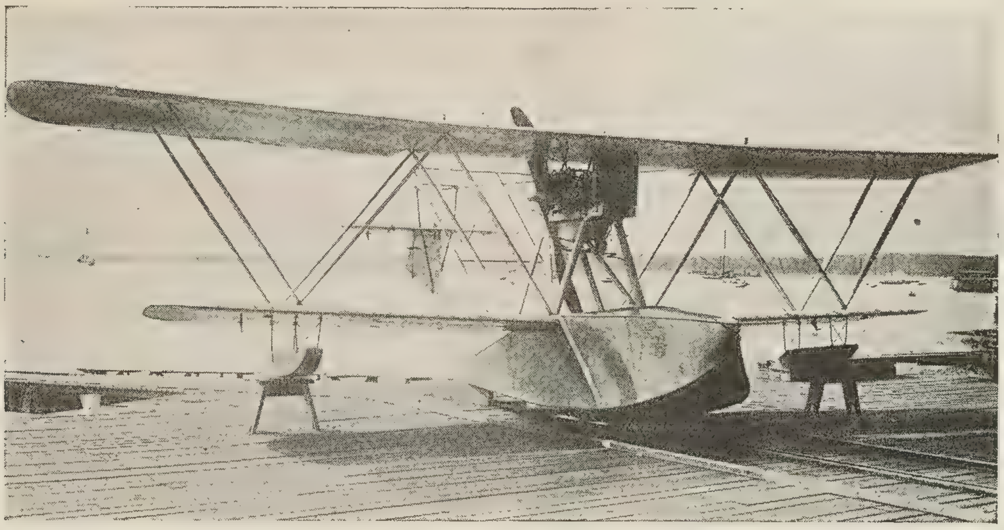
The newest Vought Product, Model VE-10 3-Place Flying Boat—



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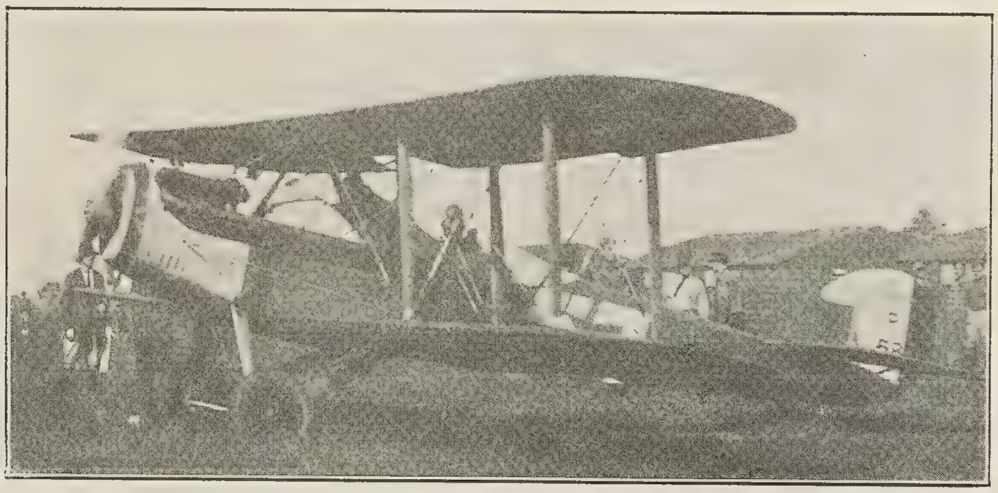

¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

¶ Adopted by U. S. Army Air Service as the Standardized Advanced Training Type.

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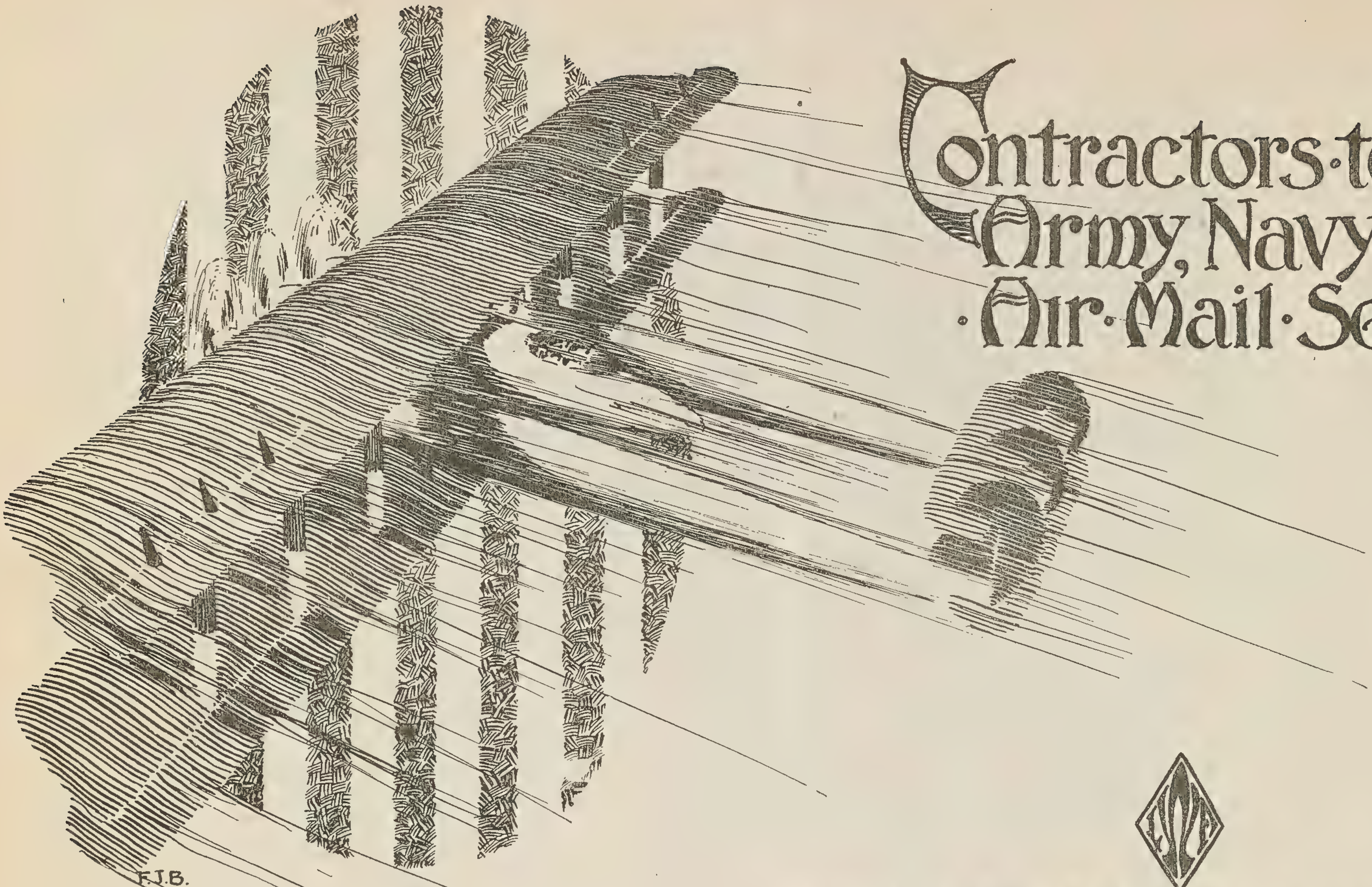

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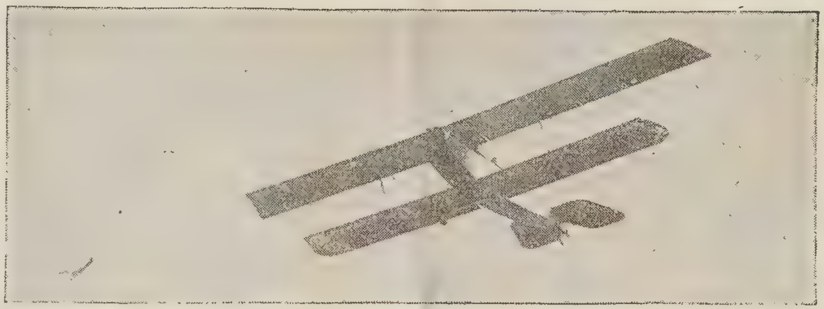

WISE pilots are starting a business of their own with a rebuilt Curtiss JN (some cost as little as $2,000) carrying passengers and giving exhibition flights. Some have paid for their planes in the *first few days.*

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V #20

AIRCRAFT JOURNAL

November 22-29, 1919 *Every Saturday* *Price Ten Cents*

An Avro Looping

Owing to the General Strike of the New York Printers This Issue Was Printed in a Rural Newspaper Office

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

The Glenn L. Martin Company
CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

Hull Bill Reflects Pershing's Ideas

Personnel Unchanged, But Separate Department For Design, Engineering and Equipment

Congressman Hull of Iowa introduced on November 5 in the House of Representatives a bill to create a Department of Aeronautics and to provide for the necessary officers, employees, money, equipment, land and leases to design, manufacture and produce aeronautical equipment for the United States.

In a general way this bill reflects the policy outlined by General Pershing in his testimony before the congressional committees which are passing on the Army reorganization bills. It will be noted that this bill leaves that the Army, Navy and Post Office their personnel and operations and gives to a Director of Aeronautics the design, engineering and supply of equipment and assigns to the department all aviation fields and equipment now controlled b-- any department of the government.

The Bill (H. R. 10380) follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a department is hereby created and established to be known as the Department of Aeronautics, which shall be separate and distinct from any executive department, with a Director of Aeronautics, who shall be the executive head thereof, and who shall be appointed by the President with the approval of the Senate, and whose tenure of office shall be the same as the heads of the executive departments, said Director of Aeronautics to receive a salary of $10,000 per annum.

Sec. 2. That three Assistant Directors of Aeronautics shall be appointed by the President, each of whom shall receive a salary of $5,000 per annum, and it shall be the duty of one assistant to devote his efforts to developing aeronautics for the Army, one to develop aeronautics for the Post Office Department and such other governmental departments as might have occasion to avail themselves of the same.

Sec. 3. That there is hereby transferred to the Department of Aeronautics all such offices, bureaus, divisions, sections, or branches of the Government as pertain to the development or production of aircraft, together with the employees so engaged at the discretion of the Director of Aeronautics with and by the consent of the President of the United States.

Sec. 4. That the Department of Aeronautics shall be provided with administrative employees similar to each and all departments of the Government in so far as it is necessary to carry out and fulfill the provisions of this Act; that the salary of said employees shall be fixed by the Director of Aeronautics by and with the consent and approval of Congress.

Sec 5. That the Director of Aeronautics shall be authorized and empowered to engage and employ such inventors, engineers, scientists, experts, special agents, and employees as is necessary to carry out the purport and provisions of this Act, that the salary of the employees, special agents, experts, scientists, engineers and inventors be fixed by the Director of Aeronautics by and with the consent of Congress.

Sec. 6. That on and after the passage of this Act any and all unexpended appropriations made for the development or production of aircraft shall be transferred to the Department of Aeronautics; this shall include any and all moneys appropriated for the development, purchase, manufacture, leasing or acquiring in any way aircraft of any kind by the Government.

Sec. 7. That within sixty days after the passage of this Act there shall be transferred and conveyed to the Department of Aeronautics any and all aviation fields, lands, leases, buildings, tools, equipment, aeroplanes, aircraft of any description, any and all aeroplane parts, and anything pertaining to aeroplanes or aircraft or by the mnufacture thereof held or controlled by any department of the Government:

Provided, That immediately upon such transfer any executive department of the Government using or employing aircraft may make requisition upon the Director of Aeronautics for such aircraft, fields, tools, buildings, or other equipment necessary to operate or maintain aircraft, and the Director of Aeronautics may, in his discretion, transfer, return, or convey to such department the same for temporary or permanent use: Provided, however, That it shall be within his authority to designate the department to whom such transfer, return, or lease shall be made: Provided further, That the Director of Aeronautics in his discretion shall reserve the right to maintain, repair, and equip such aircraft and to maintain such necessary stations, offices, shops, tools, employees, equipment to maintain and repair said aircraft as he shall in his opinion deem advisable for the fulfillment of the provisions of this Act.

REPRESENTATIVE F. H. LA GUARDIA

Sec. 9. That the Director of Aeronautics shall have entire and complete authority and control of the designing, developing, and production of all aircraft or matters relating to aircraft to be used by the Government; that it shall be his duty to produce and provide the best designs and most efficient aircraft for the various departments of the Government in sufficient numbers as far as possible to fill the requisitions made upon him by said departments.

Sec. 10. That the executive home of the Department of Aeronautics shall be in the capital of the United States, and the President of the United States shall provide the Director of Aeronautics with such offices, buildings, furnishings, equipment, or any other articles and supplies necessary to the fulfillment of this Act.

Sec. 11. That all other Acts or parts of Acts not in accordance with the provisions of this Act are hereby repealed.

La Guardia's Triumph

F. H. LaGuardia has just been elected President of the Board of Aldermen of New York City, where he was born December 11, 1882. His parents moved to Arizona, where he received his public schoool and high school education. He won his degree of Bachelor of Laws from the New York University and was admitted to the bar in 1910.

From 1901 to 1904 he was in the American consular service at Budapest and Trieste, and in 1905 and 1906 he was American consular agent at Fiume, which was his mother's birthplace.

Before his election to Congress he was Deputy Attorney-General of New York State. When he presented himself as the Republican candidate for Congress in the Fourteenth District of New York he surprised politicians by defeating his Democratic rival.

When the United States entered the war he enlisted in the Air Service and was sent to a training camp, where he won a lieutenancy. He went to France and later was sent to Italy, where his familiarlity with the people, their problems, aims and language made him of exceptional value. His work won him continual promotion and ultimately he became a major. He was presented to the king and was in constant touch with the highest military and civil officials in Italy.

While abroad he was renominated for Congress and had the unique distinction of winning without having made an individual appeal to his constituents. He defeated Scott Nearing, a Socialist candidate.

Upon his return to this country he immediately took an active part in the world problems confronting Congress and made a reputation as a strong speaker.

He was nominated for President of the Board of Aldermen despite his wishes to remain in Congress, but accepted the nomination in the spirit of duty.

Reprsentative La Guardia was married after his return from the war to Miss Thea Almerigotti.

COLONEL KENLY DECORATED

Col. Wm. L. Kenly, Field Artilery, of Washington, D. C., formerly Major General and Director of Military Aeronautics, has been presented with the Companion of the Order of the Bath, by Air Commodore L. E. O. Charlton, C. B., C. M. G., and D. S. O., British Air Attache.

OFF TO AUSTRALIA

The airplane Kangaroo, under command of Capt. G. H. Wilkins, and carrying a crew of four, left the Hounslow airdrome Nov. 22 on the first leg of a journey to Australia.

Inspection of Airplanes at Romorantin, France

How the Machines Were Handled From the Time of Uncrating Until They Were Assembled

[Paper read by Lieut. Earl E. Ives in the A. S. M. E. Journal.]

This paper relates to the inspection of airplanes at Air Service Production Center No. 2, Romorantin, France. All of the American built planes which were used abroad were DeHaviland-4s. They were shipped to Romorantin, France in a semi-assembled condition, there to be uncrated, set up, tested, and flown to the battle line. The plant in which this work was done had a floor capacity of 120 machines with wings on, and 76 to 100 machines without wings. In addition there was ample room for uncrating 50 machines a day and storage capacity for all this material. An airplane repair shop and a motor repair shop each of the same size as the assembly plant operated as auxiliaries to the assembly work.

When a machine was first uncrated an inspector was on the job with a handful of red rejection cards and repair shop cards. If defective material was found it was marked and the disposition to be made of it was indicated on the red card; that is it was labeled "repair" or "salvage" as the case might be. If no trouble was found these first inspectors put a card on the machine which gave it the right to remain on the assembly floor.

When the assembly work began the inspectors in the Fuselage Deparment went over every part of the machine. In checking up the machine for alignment the following rule was observed:—"With the upper longerons level in the pilot's cockpit the motor bed should be level. A line parallel to and 16⅞ inches below the top of the upper longerons in the pilot's cockpit, should bisect the sides of the tail. This line will be referred to as the line of flight of the machine. That is, it is a line parallel to the path of the machine when the machine is flying level and straight ahead at its rated speed. With the two upper longerons level with each other in the pilot's cockpit, the rudder post in the tail of the machine should be in a vertical position, and the clips to which the main tail plane, or horizontal stabilizer, as it is called is fastened, should be level. The motor should be level in the machine and the center line of the crank shaft of the motor should be parallel with and directly under the center line of the machine. The axle in the landing gear should be at right angles to the center line of the machine, and should extend the same distance out on each side of the fuselage. The clips or hinges to which the wings are fastened must be uniformly located on the sides of the fuselage and in such a position that when the wings are put on, the upper wing will be 12 in. ahead of the lower one. The center of the center section must be exactly above the centered line of the machine.

It would be impossible to mention here the details watched by the inspectors as they looked over the fuselage, but a few will be interesting. "Make sure that the controls in the floor of the cockpit are properly fastened Be sure that the main stay-rods in the under side of the machine have not been cut by some Hun sympathizer. What is in the fire extinguisher, Pyrene or gasoline? Have all the internal brace wires in the fuselage been fastened so that the vibration of the motor will not loosen them? Are the brace wires that hold the motor in place damaged by corrosion?"

The controls to the motor, and instrument leads from the motor, were carefully examined, but in doing so the inspector knew that the man who tested the motor later on would find out whether every part of the power plant was functioning, so he looked the motor over more to help hasten the work than anything else. However, every defective instrument and damaged motor part was tagged as soon as it was found.

LIEUT. A. CORTINEZ MUJICA OF THE FIRST CHILEAN AVIATION CO.

This autograph photograph was sent by Senor Mujica to the Bristol Aeroplane constructors as a memento of the first crossing of the Andes and back, during which flight he established the South American altitude record.

Before the machinee could leave the assembly floor its propeller had to be properly installed. Before its installation the propeller was checked up by the following specifications; it must be in static balance, 3 in-oz. being the maximum error. The error in track and length must not exceed 1-8 in., that is, 1-16 in. The error in pitch must not exceed 1 deg. at any point along the effective areas of the two blades, and the average error in pitch of the two blades must not exceed 20 min.

Every propeller was carefully watched for defective workmanship, and the writer has seen a great number of excellently finished oak and walnut blades uncrated in France with the hub hole bored through each at such an angle as to give the propeller a track angle of half an inch. An Englishman in looking over the propellers said: "I say why don't you fellows catch the Hun who is boring those holes for you?"

The motor, of course, received a careful test. It was placed in a concrete stall where a free current of air could be obtained, and bank of dirt received the bullets from the machne guns when their synchronizing mechanism was tested in connection with the propeller. The following requirements were rigidly demanded of every motor. After being warmed up it must run at 1600 r. p. m. without loading or choking; throttle to at least 300 r p. m. without stopping; maintain an oil pressure of not over 30 lb. nor under 15 lb. in its range of speed; maintain a speed of 1500 r. p. m. without excessive vibration or over-heating; show that it is getting proper lubrication, that its ignition and throttling mechanism are in first-class condition; and the sound of its exhaust must indicate that its valve openings are properly adjusted

After this test a rigid inspection of all water, oil, and gasoline leads must prove that there are no leaks. A second check was made of the propeller, alignment and general behavior of all motor control instruments. One instrument which was very carefully watched was the tachometer. It was very necessary to know that the motor actually developed its rated r. p. m. for with a standard propeller the motor speed was direct check on the horsepower of the motor.

Final Inspection of Machine

In the final inspection after the machine was fully rigged and before its flight test, the following alignment specifications were followed. The angle of incidence measured with a straight edge rule and level must be 3 degrees. The method of checking this is very simple. A straight edge touching the under side of the rear edge of the rear wing beam and held level must be 1 15-16 inches. from the rear edge of the front wing beam when the machine was level in its line of flight. That is, the under side of the wing must cut the air stream at a positive or lifting angle of 3 degrees. A simple jig reduced this check to the taking of one measurement, that is, the 1 15-16 inch measurement, with an over and under-limit of 1-64 inch. The didhedral angle of 3 degrees was even more easily checked. A string stretched across the top of th upper wings above the front wing beams mustc lear the center section

(Continued on page 14)

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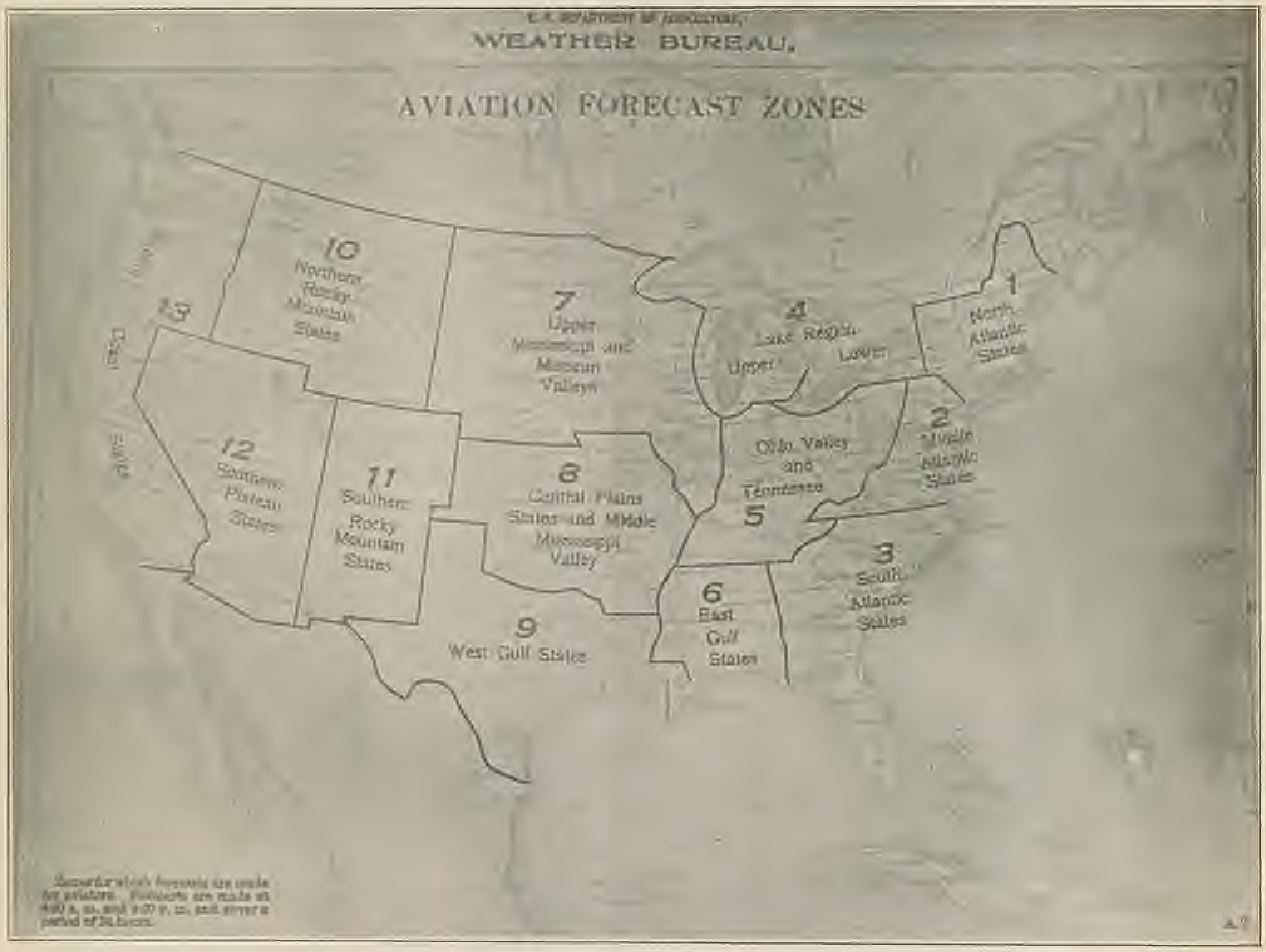
Value of Weather Information to Aircraft

How the Service Aided the First Atlantic Flight and also the R-34

To issue storm and weather warnings for navigation (marine) was by law one of the first duties of the Weather Bureau. Its use of warning advices and information for the navigation of the air is but one among other logical extensions of its work brought about chiefly by the war. As early as 1898 the Bureau began the taking of upper air observation, and work of this character has been carried on almost continuously since 1907. The data derived have been of great value in connection with aviation and the carrying on of military operations, and Congress readily granted the funds needed to enlarge the service to supply the needs of the Army and Navy in carrying on the war. Abreast with the need, a service of advices, forecasts and warnings, in aid of aeronautics has been created in the Weather Bureau. It has been in operation since December 1, 1918, and is offered and available to those who may be benefited by it. It is limited as yet in both funds and personnel, but Congress will doubtless make other provisions as needs develop. The service already performed in the past few months illustrates its operation and testifies to its worth.


U.S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.
AVIATION FORECAST ZONES
1 North Atlantic States
2 Middle Atlantic States
3 South Atlantic States
4 Lake Region Upper Lower
5 Ohio Valley and Tennessee
6 East Gulf States
7 Upper Mississippi and Missouri Valleys
8 Central Plains States and Middle Mississippi Valley
9 West Gulf States
10 Northern Rocky Mountain States
11 Southern Rocky Mountain States
12 Southern Plateau States
13
Coast
Pacific

[C] U & U

Value in First Atlantic Flight

When the first trans-Atlantic airship flight was perfected by the U. S. Navy the need of accurate meterological reports of surface and upper air winds and their attendant weather such as clouds, fog, and visibility was early seen and their importance in such an undertaking fully recognized. As the Weather Bureau was the logical organization on this side of the Atlantic Ocean capable of handling an affair of this importance and magnitude, its aid was sought by the Navy Department in supplying the meterological information and forecasts needed by the aviators making this flight. It, the Weather Bureau, had to do with the planning of the arrangements for securing meterological reports from the Atlantic Ocean and Europe, and with the Weather Bureau was placed in full responsibility for the making of the forecasts for the guidance of the aviators from the time they left Rockaway to the time they reached the Azores. That the forecast fulfilled every expectation has been attested by officers of the Navy.

Active military operations are now happily over. Civil aerial transport exists and commands attention. Few are bold enough to guess perhaps what is before us, but full knowledge of weather conditions is vital to the successful navigation of the air and the conservation of life and property.

Value of Information to R-34

Another example of the importance of meterological information and forecasts to aerial navigation is that in connection with the recent visit of the Brtish dirigible, the R-34, to our country. The first call for meterologcal information and forecasts was received from the commander of this airship when off New Foundland, and was by radio through the shore station at Cape Race. Immediately on receipt of this call in-

(Continued on Page 9)

Trade Review

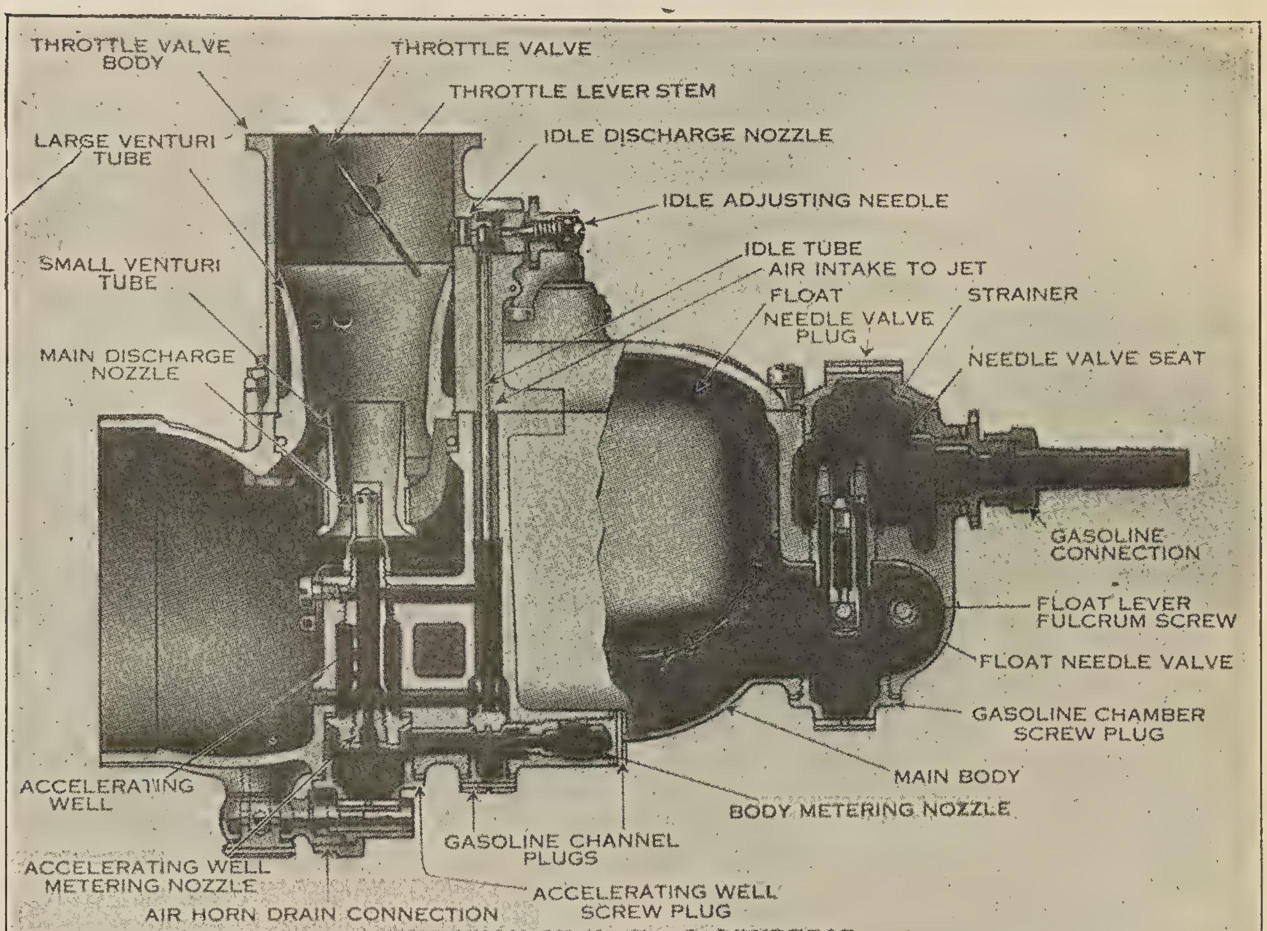
STROMBERG CARBURETOR

The Stromberg Carburetor is standard equipment on all Hispano-Suiza aeronautical motors and these motors have thoroughly proved their value during the recent war.

Probably the most noticeable feature of this carburetor and surely the most important, is the care shown and security of, the mechanical construction. Regardless of the careful calibration of the carburetor in the shop, each hone is subject to artificial suction tests in the test laboratory, thereby maintaining an absolute standard of accuracy in performance. The Stromberg Motor Devices Company is further equipping its laboratory with means for testing carburetors under conditions of altitude.

Figure 1 is a section through a Stromberg Carburetor showing clearly all important parts.

The float construction is valuable inasmuch as it gives a positive control of the fuel feed at practically all angles at which fuel can flow from the supply tank. This action functions positively when the carburetor is on its side or under the sidewise strain of a sideslip or skid. Figs. 2, 3 and 4 show the conditions of the carburetors in different positions of flight. During the dive, climb or side-skid, the action is normal, due to the way the float is suspended. When the motor is stalled with the plane upside down, the float is no longer supported by the gasoline and the valve shuts off as in Fig. 4. It is obvious that to obtain these advantages the carburetor should be attached to the motor in such a way that the float pivot is toward the tail of the machine.



SECTION OF NA-D 4 CARBURETOR
Fig. 1

STROMBERG CARBURETOR

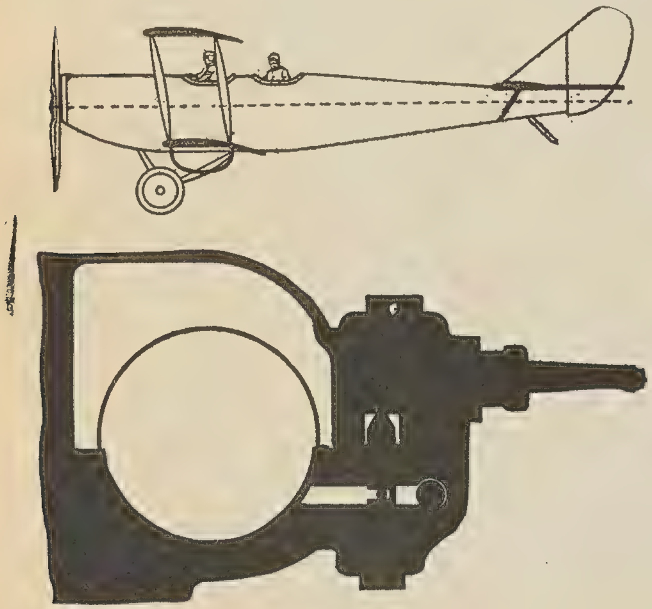


FIG. 2

The float needle is fitted with a spring to prevent the chattering which has heretofore made it almost impossible to keep carburetors from leaking in airplane service.

Before the fuel reaches the needle-valve, it must pass through a strainer. This is held down by a spring and can be readily removed after the valve plug is taken out.

Springs are placed on the throttle and altitude control shafts, so that much of the wear from vibration of these parts in service is avoided. The throttle operating lever is fitted with adjustable stops, one of which locates accurately the position of maximum power, while the other stops the throttle closing at a point which gives the maximum desired engine speed for idling. Fitting the throttles in a double carburetor is quite a delicate operation and the valves should never be loosened unless absolutely necessary.

The carburetor air entrance is usually horizontal and arranged in such a way that a back fire will not ignite any leakage around the motor. Any air conduits to the carburetor air entrance should be as large and direct as possible.

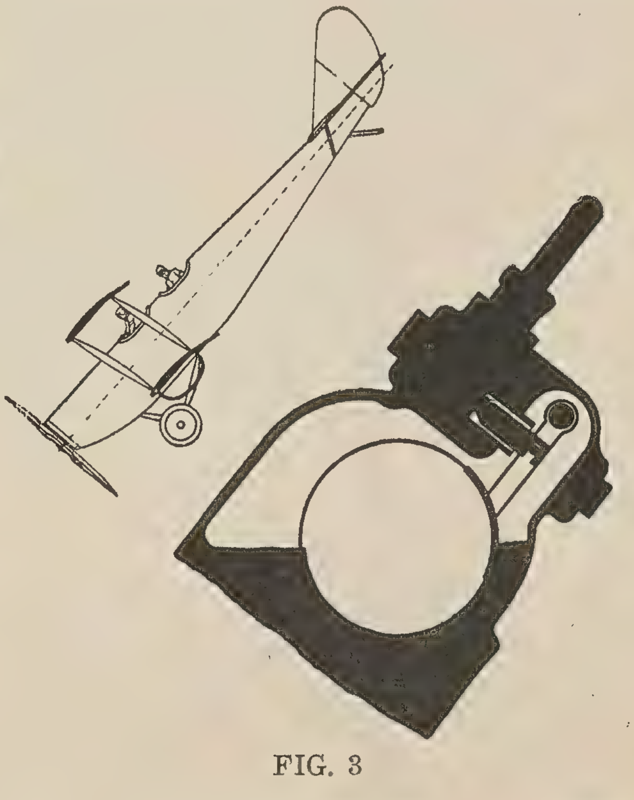


FIG. 3

In Stromberg carburetors the fuel discharges through a special type of jet. This consists of: a metering nozzle, which regulates the passage of fuel from the float chamber,—a small air passage and air bleed holes through which air is drawn into the jet, where it is discharged with the gasoline through the main discharge nozzle,—and an accelerating well chamber which holds a reserve supply of fuel to be discharged as the throttle is opened, thus supplementing the normal gasoline flow.

The idling jet is practically a small auxiliary carburetor. As this jet draws its fuel supply from that already metered to the main fuel passage, there is no conflict in their action, the fuel being discharged from the idling jet at small throttle openings, and from the main jet at wider throttle openings.

Altitude control is effected by means of two valves in the top of the float chamber, enabling the pilot to keep the pressure in the float chamber the correct percentage of the suction on the nozzle at any altitude.

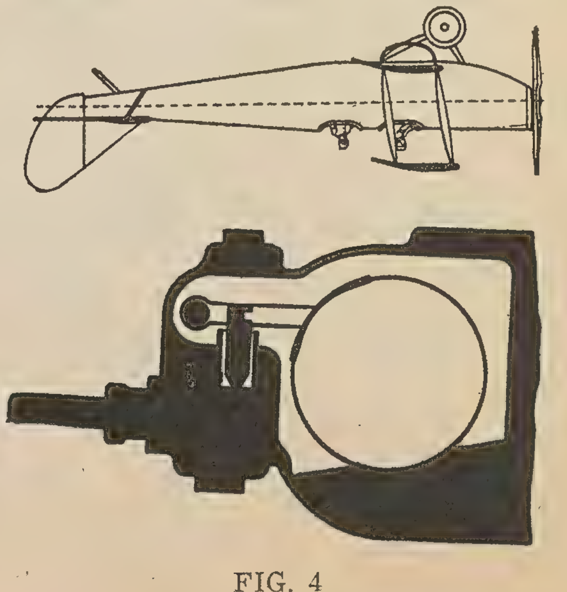


FIG. 4

Demonstration Campaign of the Curtiss Ships

Eagle in 82 Trips Carried 476 and the Oriole in 267 Trips Carried 379 Passengers

UNDER THE M. I. T. WIND CHANNEL

The aerodynamic balance shown in this photograph is located directly underneath the wind channel in the Department of Aeronautics at the Massachusetts Institute of Technology. By means of adjusting the weights on this balance the operators can determine the force which the artificial wind exerts on the airplane model in the channel above. This balance, which is the only one of its kind in this country, is so accurate that it can measure to within 1-10,000 of a pound.

In the photograph (seated) are the government directors, George M. Denkinger (left) and C. D. Hanscom (right). This institution is now raising a $10,000,000 Endowment Fund.

Making a total number of 349 successful flights and carrying almost a thousand passengers was the unique record of the Curtiss expedition to Washington recently. The Curtiss Eagle, the new eight-passenger limousine machine, made a total of 82 flights during the ten day trip, carrying 476 passengers while the three Curtiss Orioles made 267 flights and carried 379 passengers.

This expedition—the first of its kind ever attempted by any aeroplane company in the U. S. A.—was taken for the purpose of demonstrating two of the new types of commercial planes developed by the Curtiss Aeroplane & Motor Corporation—during the present year and also as an educational campaign to show the possibilities of flying.

The Eagle, the first tri-motored land machine built in America, was piloted by Bert Acosta, one of the pioneer pilots, while the Orioles were piloted by J. A. Morrell, formerly of the Royal Air Force; Paul F. Collins and William H. McMullen, formerly of the U. S. Air Service. Captain Morrell established a record for the largest number of flights by making a total of forty-five flights, carrying more than fifty people, in one day.

Among the distinguished officials who took flights in the Eagle and Orioles were Otto Praeger, second-assistant postmaster-general and head of the aerial mail; General Charles T. Menoher, director of the Air Service; Benedict Crowell, second assistant secretary of war; Mrs. Newton D. Baker, wife of the secretary of war; Mrs. George Barnett, wife of the commandant of the U. S. Marine Corps; General L. E. O. Charlton, British air attache; Herman Lundquist, speaker of the lower house of Sweden and Lt. Com. P. N. L. Bellinger of the NC-1.

Three United States senators made trips over Washington in the Eagle—Harry S. New of Indiana, I. L. Lenroot of Wisconsin, and Carroll S. Page of Vermont.

Among the representatives were: A. E. B. Stephens and C. J. Thompson of Ohio; Clark Benedick of Rhode Island; Sidney Anderson of Minnesota; H. E. Hull and W. R. Green of Iowa; Patrick McLand of Pennsylvania; W. B. McKinley and W. E. Brooks of Illinois and W. P. Martin of Louisiana.

Following are the members of the legations who made flights: Robert Silvercruys, Beligum; Yung Kwai, counselor and charge d'affairs, Teh-Yuen Liu, naval attache, Lt. Chu Fong Lin, Ensign Tsen Shih-Chang, China; Lt. A. A. Dedouloff, Lt. A. R. Wiren, Lt. A. I. Snironoff, Capt. I. V. Mishtowt, naval attache, Col. A. Nikolaioff, military attache, Russia; Senor Don L. A. Penaherra, attache, Ecuador; Pedro Rodigues Capote, counsel and charge d' affaires, Senor O. Garcia J. Acme, Dr. Jose T. Baron, second secretary, Jose Van der Gucht, naval attache, P. A. Bonet, commercial attache, M.

(Continued on page 14)

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AIRCRAFT
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GEORGE NEWBOLD. . *Business Manager*

Formerly Air Service Journal

America Defenceless

FAILURE of the Joint Committee on Appropriations to report out the $15,000,000 appropriation added by the Senate for the purchase of battleplanes for the defense of the United States is a calamity. The chief officers of the Air Service, the Secretary of War and all who know anything regarding the defenseless condition of the country aerially urged this immediate appropriation on the soundest grounds. We haven't an American pursuit ship; we haven't a reconnaissance plane, or a night bomber that could be used in modern warfare. We have excellent sample types of all sorts, but none available for combat or even for training. The American aeronautical engineers have designed the best airplane in the world, in our opinion. If they can be built the United States will take rank with the leading nations in aircraft defense. If none is built for a year this country could not handle Mexico properly in the event of a sudden air raid.

The aircraft industry which has been gradually disintegrating is now in the last state of hopelessness. If Congress does not give the Army an opportunity to let some orders for machines this year, it is certain that when the time comes there will be no large and responsible companies to handle the work. The House seems to be of the opinion that any money given to those at present in charge of the Army Air Service will be thrown away or wastefully expended. Until the new United Air Service is an accomplished fact there seems to be no hope for any building program.

Unified Air Service

FEW officers of our Army fail to see the many advantages of a Unified Air Service from an industrial point of view. They appreciate, too, the necessity of a properly organized industrial life, before the nation can wage a war with a world power, or even in so far as aircraft is concerned, with a second rate power. But these advantages are outweighed in the minds of many by a belief that tactical success in war would be greatly jeopardized by having aircraft which are employed for such widely varying functions as those of the army, the navy, and commercial life controlled and regulated by one governmental department.

It is easy to see how such a belief could arise. Our knowledge of the tactical employment of aircraft is derived wholly from the experience of the world war. In the beginning, aircraft was employed solely for observation. As the war continued, there developed air fighting and the attack of ground troops with bullet and bomb. These latter roles, non-existent in the beginning, grew in importance. By the signing of the armistice, they had come to be the work of a majority of air units, and it required little foresight to perceive that this tendency would become more marked as time went. There is needed, in fact, a revision of our conception of air tactics. The role of air forces has gone far beyond that of merely furnishing an elevated platform for observing the enemy.

There is a striking analogy between the roles of the Navy and of the air forces. Where two powers are separated from each other by the sea, it is recognized that the power with naval superiority alone can attack. A necessary preliminary, therefore, to the land decision—which is the final decision—is a decision on the seas. From this it has become an axiom that the role of the navy in war is to seek out and destroy the hostile navy. In wars of the future, the decision may or may not be preceded by a huge naval battle. That will depend obviously on whether the belligerents are separated by intervening seas. But the ocean of air that bathes all countries will assuredly be the theatre of the preliminary fighting of all future battles, whether land or naval, and, as Marshal Foch has observed, victory will incline to the side that secures air superiority. The role of the air force is now in large part to seek out and destroy the hostile air forces. A subsequent vital duty is the destruction of the enemy's land or naval units. Observation, though of great importance in its results, may eventually be the role of a numerically small part of the air forces.

Landing an Airplane on Board Ship

WHILE many successful flights have been made in the U. S. A. off the decks of battleships, we have not heard so far of attempts being made to land airplances on the same decks since the San Diego experiments of 1911.

It is interesting to read that at a foreign Marine Experimental Aircraft Depot there has been conducted a series of tests of deck landing devices. The first of these constituted an inclined wire-rope way to be fitted over the stern of the ship and a B. E. fitted with a special chassis was actually landed on it. A more successful method was one in which sandbags attached to ropes were stretched across the landing deck and an attachment fitted to the plane which picked up successive ropes during the process of pulling up.

These methods are worthy of interest and we may expect sooner or later similar attempts made over here.

Altitude Flight

IN a recent address before the American Flying Club, Brig.-Gen. Mitchell, confidently predicted that Europe would be reached in six hours and the trip around the world could be made in a day or two by the altitude airplane of the future.

This possibility is based on two inventions which have already been successfully tried out at McCook Field. One is a turbo compressor and the other is a variable pitch propeller.

With the turbo compressor it is possible to maintain the power of the engine at altitude. With the variable pitch propeller it is possible to adjust the propeller pitch so that full advantage may be taken of the greater power provided at altitude, and with the combination of the turbo, speeds of 200 to 250 miles per hour come within the range of possibility, and Gen. Mitchell's address is a timely and authoritative insistence of this wonderful possibility.

An Aerial Customs Office

IT is an interesting reminder of the fact that Aviation is becoming more and more commonplace, more and more a part of our daily life, to read that the British have an official entitled "Officer in Charge of his Majesty's Customs and Excise at Hounslow Aerodrome."

Every commercial airplane entering or leaving England must be reported to this officer, and the nature of the goods carried declared. Difficulties at first encountered were rapidly overcome; and the system is working smoothly. There is an average departure of three machines a day. On some days the departures for the continent were as many as eight.

This constitutes very encouraging news.

Value of Weather Bureau to Aircraft

(Continued from page 5)

formation of the prevailing weather and winds along the American Coast north of New York and forecasts of wind and weather conditions were sent twice each day until the airship reached Long Island. Perhaps the most important information contained in these advices was sent when the airship was flying between Nova Scotia and Cape Cod, encountering head winds and its supply of fuel nearly exhausted. The prediction was to the effect that the wind would change to the northeast within the next 12 hours. Unquestionably this change in the wind was most timely and enabled the airship to reach its destination without the aid of torpedo boats. During all the time that the R-34 was moored at the flying field on Long Island advices three times each day concerning the probable wind and weather conditions were supplied its commander. Its dramatic departure was made on urgent recommendations from the Weather Bureau to the effect that a storm was approaching rapidly from the region of the Great Lakes, that the wind and weather conditions, then favorable for a start homeward, would continue but a few hours longer, and that to remain moored on the flying field would be at the risk of having the airship torn from its moorings and swept away by winds and squalls that would set in before the expiration of the night. This bulletin was sent as an urgent message at 9 p. m., and at midnight the R-34 was on her homeward flght under exceptionally favorable winds and weather conditions. It is fortunate that she left when she did, for the following morning the wind was blowing half-a-gale, rain had set in, and atmospheric conditions were most dangerous for an airship unprotected on a flying field. In the meantime the R-34 was miles eastward, flying in good weather and with strong following winds making exceptionally fine speed. That the work of the Weather Bureau in this connection was appreciated is evidenced by the following message received from her meterological officer via radio after her departure: "Many thanks for kindly and efficient manner in which weather information has been supplied. Very grateful."

These are but samples of what the Weather Bureau will and must do for aerial navigators in the future, not only in the matter of trans-Atlantic flights but more particularly to safeguard flying in the United States.

Service Standardized

The Weather Bureau has for some time past made forecasts for the air services of the Army and Navy, and in the immediate future its service will be enlarged and standardized. Since August 10, 1919, "Fiylng Weather" forecasts have been made systematically for the United States by zones as follows: No. 1, North Atlantic States: No. 2. Middle Atlantic States; No. 3, South Atlantic States; No. 4, Lake Region; No. 5. Ohio Valley and Tennessee; No. 6, East Gulf States: No. 7, Upper Mississippi and Missouri Valleys: No. 8, Central Plains States and Middle Mississippi Valley: No. 9. West Gulf States: No. 10, Northern Rocky Mountain States; No. 11. Southern Rocky Mountain States: No. 12. Southern Plateau States; No. 13, Pacific Coast States.

The zonal map shows the geographic districts into which the United States have been divided for the purpose of aviation forecasting. These forecasts will be issued twice daily, at 9:30 a. m. and 9:30 p. m., and will be immediately supplied the Air Service, U. S. Army, for dissemination to their airfields. It is presumed that the U. S. Naval Air Service will sooner or later need similar information for the coastal zones It also seems probable that the press services will handle the forecasts for distribution to the regions where flying is more or less general, for it is manifestly true that meterological information and forecasts are destned to become of even greater importance to the navigator of the air than to the navigator of the seas or the dweller on the lands.

The Weather Bureau through its chain of meterological reporting stations and its trained personnel is at attention and prepared to handle the many problems that will have to be handled to save the lives and the ships at sea during the years since Congress planned and legalized its organization for this purpose.

Home Ins. in Aviation

The Home Insurance Company is preparing to enter the field of aircraft insurance and will shortly announce to its agents the forms of cover and rates to be charged. Recognizing that the moral hazard will be an important feature in this class of businesss, special stress will be laid upon the importance of a careful investigation of the financial standing, aviation experience and condition of the aircraft of the assured, together with the uses to which the machine is to be put.

E. S. Martin has been appointed manager of the Home's aircraft insurance department and assumes his new duties to-day. Mr. Martin was formerly with the insurance brokerage house of L. T. Hollister, Inc., and is considered exceptionally well informed on aircraft hazards. Formal prospectus of proposed new aircraft cover will shortly be issued to the Home's agency force.

Importance of Physical Hazard

Physical hazards of the aircrafts to be insured will also be given serious consideration, as it is recognized that many aircraft are coming into commercial use, which have had severe neglect or abuse during their operation in the army or at the training camps. Such planes when damaged have not been efficiently repaired and are, therefore, not good risks in many instances. The sale of these types, the announcement states, should be discouraged, and insurance protection cannot be secured for them. While making these restrictions as to the class of risks to be assumed, the object of the Home Insurance Company in extending its average to include this new phase of insurance is to encourage the conservative development of aviation in this country and to eliminate such ventures that might prove destructive to further development.

Forms of Cover to Be Issued

The lines of aircraft insurance which the Home proposes to write include fire, theft, collision and property damage, and apply to the maintenance, operation and use of aircraft for private and commercial purposes, including the transportation of passengers. All policies are to be written at the home office after receipt of full information, and no policy will be issued for

The rates to be established for the vari-

a period longer than six months.

ous hazards involved have been decided upon the following basis of cover and will be for the six months period:

Fire Insurance—Covering fire from any cause and lightning, at any location, while in flight or while being transported.

Theft Insurance—Covering theft of the machine or any of its parts, excluding, however, the first $100 from every loss, and coverage only issued in connection with fire policy, with warranty of housing in recognized hangar.

Collision Insurance—Covers direct damage to plane and equipment as result of collision with any other plane or object or with the earth or impact with water. This cover will contain 10 per cent of deductible clause, excluding 10 per cent of the amount of the insurance from each separate loss.

Property Damage—Covers liability of the owner of the plane for damage to the property of others not carried on the aircraft. and demonstration work will be permitted for an additional premium when such work is conducted by experienced pilots.

Issued From Home Office Only

The Home will only issue policies or binders from its home office and agents submitting the business will be allowed a commission on all classes of aircraft business of 10 per cent. Owing to the nature of the business, premiums will be due when the policy is issued and at least 40 per cent of the premium must be guaranteed to be paid if a binder is issued, even if cancelled within a few days. Endorsements allowed will include: In connection with collision clause, 10 per cent deductible; water and earth landing warranties for reduced rate; property damage, $1,000 limit and $25 deductible; tornado cover; passenger carrying permit; standing and sinking clause; and $100 theft deductible.

R-80 Soon Ready

The British rigid airship, the R-80, will be completed before Christmas and handed over by the manufacturers, Vickers, Ltd., to the Admiralty. The R-80 embodies the latest improvements in British design. She is 535 feet long, 70 feet wide and has an overall height of 85 feet.

Her lifting power will be 76,000 pounds, or thirty-eight tons, and four airship engines, each of 240 horse power, will give her a maximum speed of sixty-five miles an hour. A crew of fifteen or sixteen is necessary to navigate her.

Fliers for the Poles

The Kosciuszko squadron of American aviators has left Warsaw for Lemberg, to join the Polish pursuit squadron, which Major Cedric E. Fauntleroy, an American, will command.

The squadron is equipped with the latest Austrian albatros machines and expects to go shortly to the Bolshevik front. Lieut. E. P. Graves of Boston and E. W. Chess of El Paso are expected to join the Americans within a week. Major Fauntleroy is seeking a few more American fliers for his squadron.

I. A. STANDARDS COMMISSION

A joint resolution introduced in the House of Representatives authorizes the President to appoint delegates to the International Aircraft Standards Commission and appropriates $6,000 for expenses.

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the 350 Canadian Training Planes purchased from the Imperial Munitions Board of Great Britain have been disposed of.

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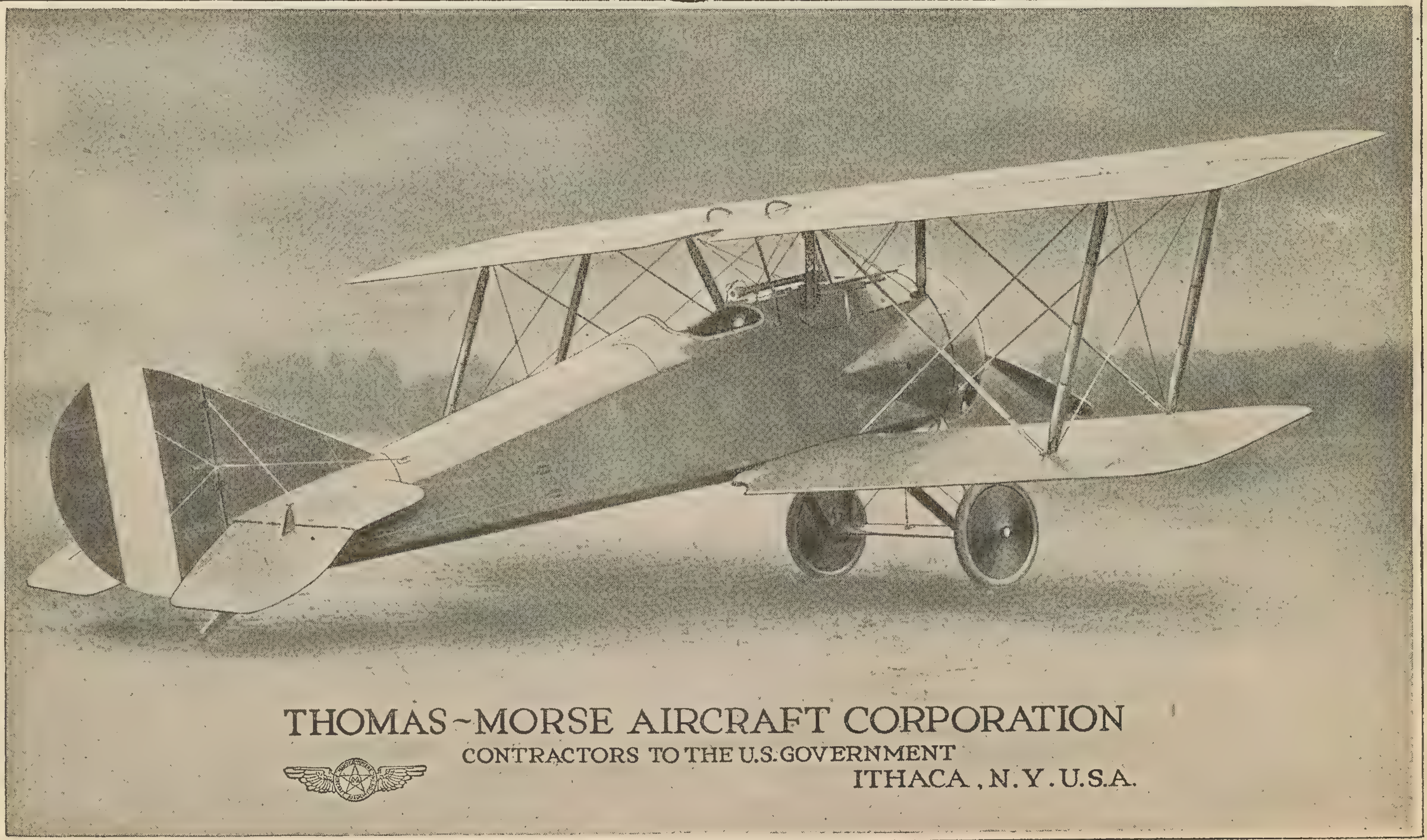

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Air Mail Activities

A gain of approximately five fold in air mileage, with a corresponding service in mail collections and deliveries has been made in the last six months by the Aerial Mail Service of the Post Office Department, according to a statement by the latter, covering air mail activities from May 15, 1919, to November 22, 1919.

Between May 15 and November 22, this year, the Air Mail has flown a total of 305,619 miles, or more than the distance of twelve times around the world. During the six months preceding, air mail planes flew but 61,173 miles. The astonishing gain is explained by the fact that on May 15, 1919, was inaugurated the New York-Chicago air mail route, an air line of 710 miles navigate one daily in each direction. Prior to this extension the sole air mail line was from New York to Washington, a distance of 218 miles, navigated then as now, once daily in each direction.

The Air Mail Service has had three fatalties during the past six months, or one fatality for each 101,875 miles flown.

At the same time, there have been 34 forced landings, due to mechanical troubles. This amounts to one forced landing for every 8,988 miles flown, or a distance equal to approximately four round trips between New York and San Francisco.

On the route between New York and Washington there were 19 forced landings, or one for each 3,742 miles. On the route between Cleveland and Chicago there were 8 forcd landings in 120.923 miles flown, or one for each 15,115 miles. On the route across the Allegheníes, between New York and Cleveland, there were 7 forcd landings in 113,595 mils flown, or one forced landing for each 16,226 miles operated.

Fourteen of the forced landings were made with Curtiss R4 planes equipped principally with high compression Liberty 400 H. P. motors, and 14 forced landings with DH 4 planes, equipped with Liberty 400 H. P. engines. The other 6 forced landings were divided between other types of planes. The principal causes of forced landings were: oil pressure, 7; radiator trouble, 4; gas pressure, 3; foul plugs, 3; carburetor trouble, 3; short circuit in rain, 2, and loose connecting rods, 2.

Today the Air Mail Service is operating 85 serviceable planes. Six months ago it operated but approximately forty. The principal improvements installed in this period are: the use of fire-proof mail compartments, carburetor screens preventing fire, and compressed air fire extinguishers, operated automatically perfected by Dr. L. T Bussler, superintendent of the Air Mail Service. Use of parachutes is also being considered.

Hart's New Propeller

Announcement from McCook aviation field that successful tests have been made with a reversible airplane propeller means that the day of the "backyard" airplane is here.

With the new propeller, airplanes can land and be brought to a stop within fifty feet by actual test, officials said.

The new device will also increase the climbing speed of an airplane forty per cent and permit of higher altitude flying, 50,000 feet being a possible limit. Seth Hart, of Los Angeles, Cal., is the inventor of the propeller.

Will Fly All Winter

A quiet celebration was staged at the Airdrome of the Philadelphia Aero-Service Corporation recently where the afternoon class were receiving flying instructions.

Pilot Davis had just landed with a student when Manager Hower called the flying force and students about him and announced that the next flight would be the two-thousandth take-off from the field since flying was started in June of this year, and that he took this occasion to thank every one who contributed to the successful inauguration of Philadelphia's first commercial flying project and particularly to thank the pilots and ground men for their unfaltering loyalty and skill by which the present splendid results had been achieved with no more serious accident than a bursted inner tube.

Mr. Hower requested that the honor of the two thousandeth flight be given to Miss Volera Nelson, a lady student, and with Miss Nelson in the plane, Pilot Davis took off, followed by the cheers of all present. It is feared that not much instruction was attempted during the flight as Pilot Davis considered it an occasion for an air exhibition such as only the initiated usually witness. With spirals, dips, spins, loops, rolls, and turns of the high school class, the two thousandth flight was successfuly given.

The Philadelphia Aero-Service Corporation will continue their flying school throughout the winter. They feel that commercial flying means flying in all seasons.

Manager Hower announced that a high powered Aero training plane would soon be added to the school equipment to give advanced training in stunting.

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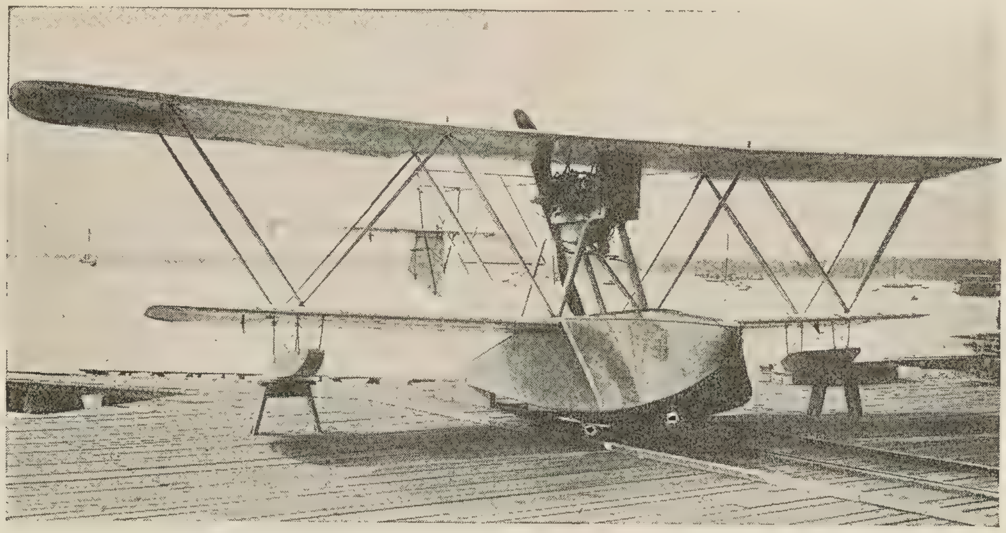

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Airplane Inspection at Romorantin

(Continued from page 4)

9 1-8 in. when it touched the wing at the center strut fittings.

But the details which must be covered on an airplane before it can be OK'd as a perfect machine are an entirely different matter. For instance, to counteract the torque of the 400 hp. motor an extra amount of incidence must be put in the left wing. If this were not done the big bird would fly as though it had lost some of the feathers from its left wing. If the interplane struts are not all of proper length, the upper wing will not have the same angle of incidence as the lower one and the pilot will say that the machine is heavy on one side, that it does not want to climb, or that it may have a heavy tail. The angle of incidence is the all important factor in the final alignment of an airplane.

The new wire, or cable, as it is referred to, will always stretch. The question of just how tight the machine can be set up and not endanger the strength of its own members and at the same time be sure of holding its alignment is one that the inspector must be able to answer without a second thought. With the check-up on equipment, and especially such special equipment as cameras, bomb-dropping sights and machine guns, comes the necessity for an inspector with a ready mind. If he is not wide awake he will surely pass his machine with some of its vital parts missing.

The compass must be adjusted after all other apparatus has been installed. The residual magnetism of the motor has a tendency to throw the magnetic needle out of its proper course. When the motor is running, the magnetism of its rotating parts produces a still heavier effect on the compass needle. Before that instrument will function, the magnetic effect of the running motor must be counteracted. The inspector must make sure that the compass needle will point straight north when the machine is in the air, and he must, if possible, get all adjusting done before the flight test.

On the field, the machine underwent a hasty inspection by the test pilot before flight. In the air it must fly level with a motor speed of 1350 to 1400 r.p.m. It must be easy enough on the controls to permit the pilot to release the stick and maintain his course and altitude with the use of his rudder alone. The motor must meet all the demands before mentioned, and in addition be able to maintain its r.p.m. in a steep climb.

The card system mentioned earlier in this paper was a great aid in getting the excellent results obtained by the inspection department. When the assembly work was begun on the machine a card 5 in. by 8 in. was put in a holder on the outside of the machine. As one part of the work was completed, or one alignment properly checked out the inspector on the job made a record of the fact on the card. At the same time if he found some defect which must be remedied before the final OK he noted it on the back of the card. When the machine was ready to leave the first department all the assembly work assigned to that one floor had been passed on by the inspector and many of the defects remedied, which might have been overlooked later on, or if discovered would have delayed the machine in its schedule. The inspector who passed the machine to the next department removed the card and put on one which, it might be said, gave it the privilege of leaving the first assembly floor. Any defects still unattended to were carried forward to the new card and the old card was filed in the inspector's office as a part of the history of that plane. This process was repeated four different times, the plane receiving at last a final OK from the inspector. This OK was on a linen tag and remained on the machine when it was delivered to the front. If at any time a defect was found that would hold the machine in the department as much as two hours over its schedule, the inspector would remove the regular inspection card and put on a repair shop card which constituted a pass to the repair shop for that machine. When the repair shop card was properly signed by the inspectors at the repair shop, the machine was placed back into the assembly process again and its old card was attached to it

Personnel of Organization

A careful selection of the men available for inspection work revealed the fact that young men with some college traning or at least high school education made the best inspectors Men skilled in automobile repair work were the poorest. They wanted to do the job themselves. Jewelers were available for instrument inspection and cabinet makers for wood work.

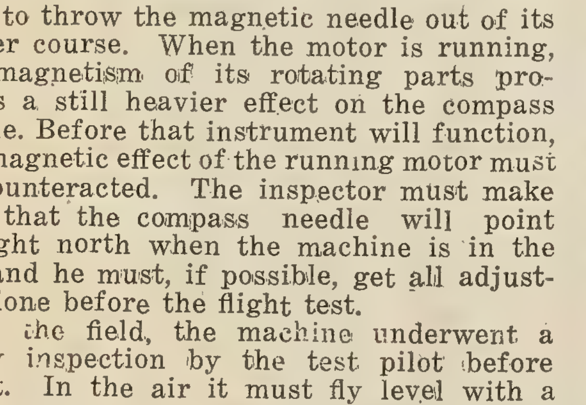
The organization, which in November was capable of passing successfully on 50 complete airplanes a day, consisted of 75 noncommissioned officers and privates, and 10 commissioned officers. Five of the commissioned officers were the pilots. There were five distinct departments, first inspection, fuselage assembly inspection, motor inspection, final assembly inspection and flight test. The daily and hourly reports came on the regular inspection cards to the inspection office from these different departments. The record of the work of the department is best told by saying that none of the 1400 machines passed by the organization, up to Nov. 11, 1918, failed on the field because of some defect inspector. overlooked by an

Curtiss Campaign of Demonstration

(Continued from page 7)

R. Cornide and C. M. Sera, Cuba; Senor Don Enrique A. Klickmann, second secretary, Chile; R. H. Haddow, third secretary, and Capt. Robert Glen, honorary attache, Great Britain; Alberto L. Moreira, counselor and charge d'affaires, Brazil; Count Goren Rosen, second secretary, John Allan A. Miller, commercial attache, and Otto Johanson, Sweden; Charles Moravia, envoy extraordinary, and Albert Blanchete, secretary, Haiti; Senor German Aramburu Lecaros, attache, Peru; L. Bysterus Heemsberk, honorary attache, Netherlands; Senor Mario Bonillas, ambassador, Senor Dr. Ricardo Huerto, second secretary, Senor Servando Berrera G, third secretary, Senor C. Serrano, Senor M. Y. De Negri, Senor Ricardo de Hoyos, Senor Gonzalo Meza, Senor Edmundo Pena, and Senor Manuel M. Torres Somelin, Mexico.

Among others were: Jack Baker, son of the Secretary of War; Mrs. Thomas Logan, Washington; Captain L. Ames Brown, Washington; the Misses Ann and Leila Gordon, daughters of General George Barnett; Mrs. E. B. Maynard, mother of Lt. Belvin Maynard, "the flying parson"; Dr. Joseph S. Ames, Johns Hopkins University; Mrs. C. F. Lea, wife of Congressman Lea of California; Y. Ischashi, Japanese labor delegation; Master John L. Wilson, son of Congressman John H. Wilson of Pennsylvania; Mrs. William F. Kirby, wife of Senator Kirby of Arkansas; Mr. and Mrs. R. E Bolling, Washington; Marjorie Stinson, the aviatrix; Dr. A. F. Zahm, aeronautical authority;; Admiral and Mrs. Simpson, U. S. N.; Mrs. I. C. Copley, wife of Congressman Copley of Illinois; Henry Lee Millege, sixteen-month-old son of Maj. John Millege of the war department; Miss E. D. Dickinson, daughter of Congressman Clement C. Dickinson of Missouri; Mrs. Tom Cowan, wife of Congressman Cowan of Arkansas; Mrs. I. L. Lenroot, wife of Senator Lenroot of Wisconsin; Mrs. W. R. Green, wife of Congressman Green of Iowa; Dr. Charles Wood, of the Church of the Covenant, Washington; Joseph H. Conlin, operatic star; Miss M. V. Goodall, daughter of Congressman Louis B. Goodall of Maine; J. W. Brooks, son of Congressman Brooks of Illinois; Mrs. N. D. Ely, wife of Col. Ely of the Judge Advocate Generals department and mother of Eugene Ely, the first man to fly a plane from the deck of a battleship; Mrs. J. M. Rose, wife of Congressman Rose of Pennsylvania; Mrs. A. H. Walters, wife of Congressman Walters of Pennsylvania; Admiral W. S. Smith, U. S. N.; Frank Field, son of Congressman William J. Fields of Kentucy, and Miss V. Sutherland.



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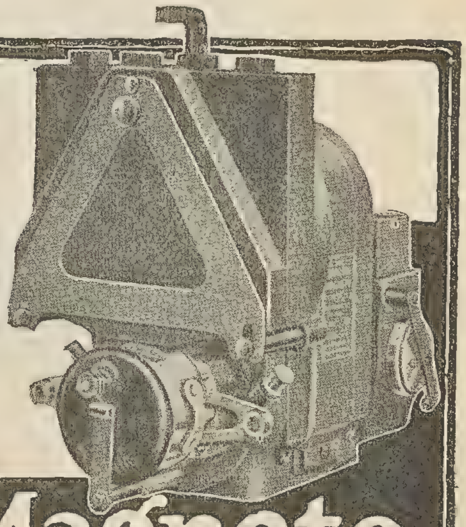

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It has been developed by the organization which furnished Canada and the United States with training machines for 95% of their cadet flyers, by the company which constructed the Navy-Curtiss flying boats, masters of the Atlantic.

The graceful and effective lines of the orange and black *Oriole* take the eye of everyone who knows and appreciates style. The appointments of the machine fulfill the promise of its appearance. A door in the fuselage just above the lower wing swings open to admit the passengers into a roomy, cushioned apartment. The pilot's "cockpit" is just to the rear. A self-starter is there for your convenience. Protection from wind and noise is afforded by the windshield and the scientifically shaped fuselage.

With a 90 H. P. motor the *Oriole* attains a three-passenger speed of 85 m. p. h. This is remarkable in relation to load and horse power employed, and with respect to economy. The gasoline cost per passenger mile in the *Oriole* is but 1 1/10 cents! With a Curtiss "Six" Motor, 150 H. P., the speed of 95 m. p. h. is no less remarkable.

There is a splendid opportunity for dealers to become identified with this profitable industry. Get in on the ground floor by writing for our sales plan for your territory.

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CURTISS FLYING STATION OF ATLANTIC CITY, INC.
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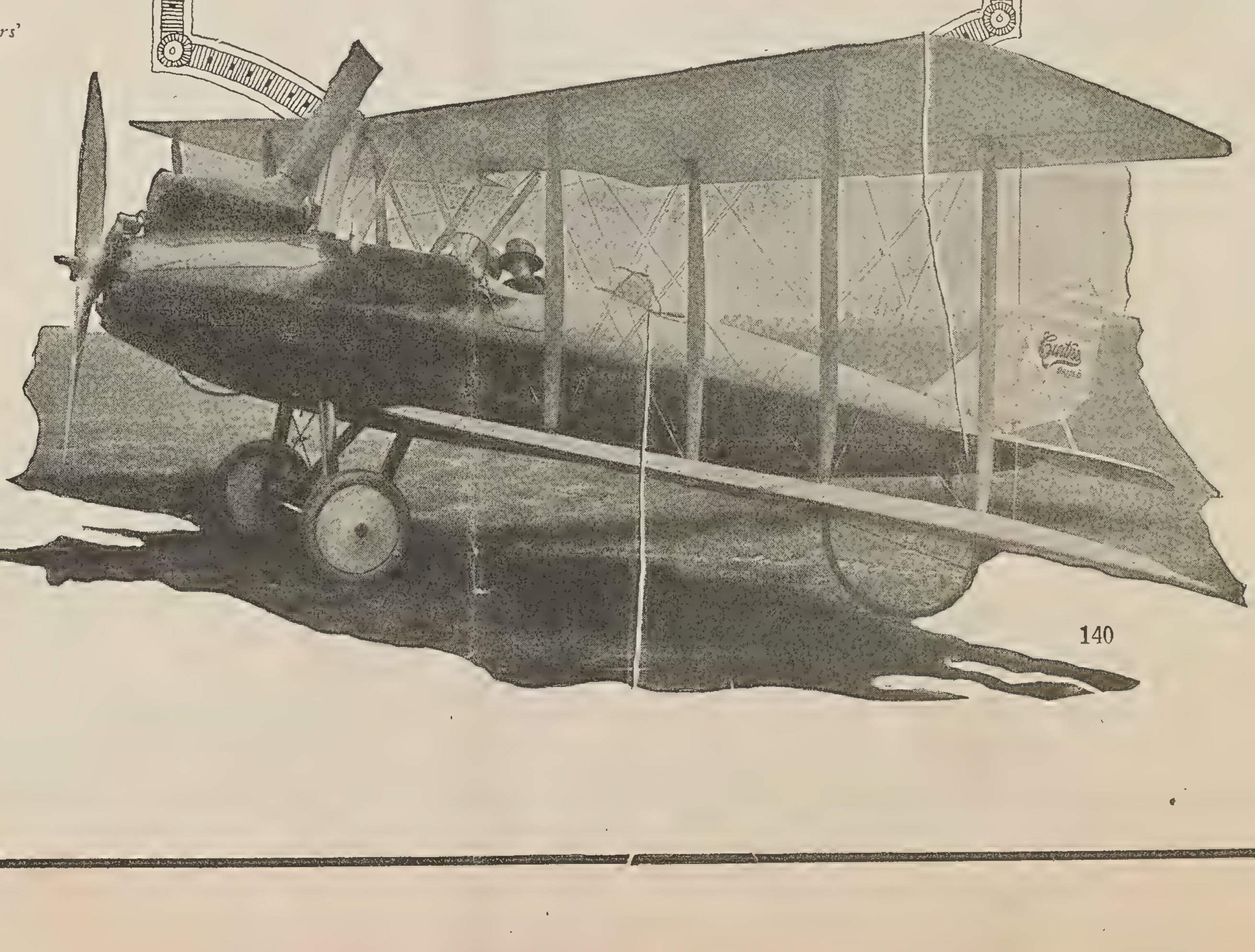

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AIRCRAFT JOURNAL

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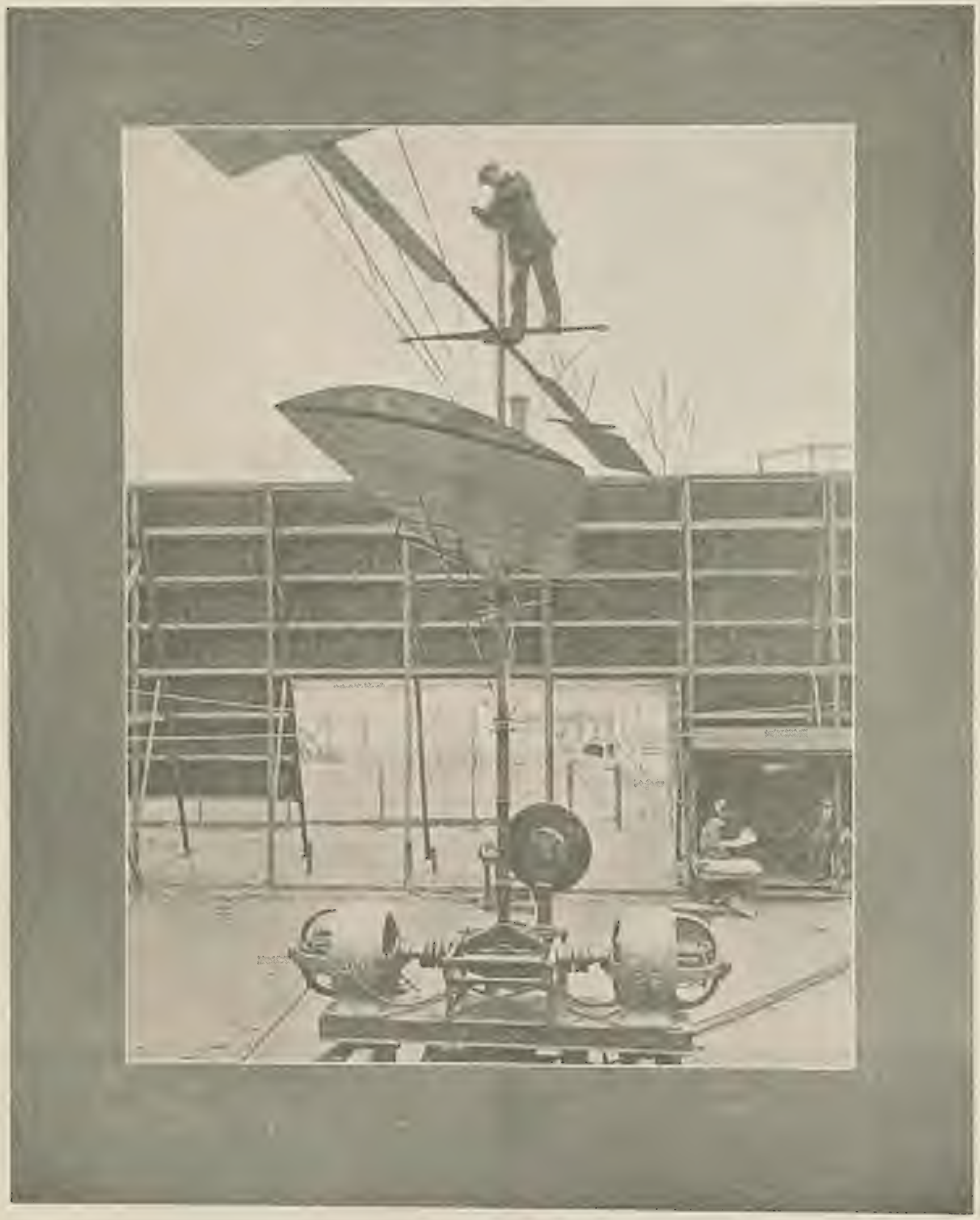

(c) International

Testing an Experimental Helicopter--American Inventors at Work

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CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

The Glenn L. Martin Company
CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

Organizing National Aviation

Direct Control, a Committee on Aeronautics and Up-to-Date Airplanes Are Required

Recent Address of Brig. Gen. William Mitchell, Chief of Training and
Operations Group, Army Air Service, Before the American Flying Club

In organizing its national aviation, every country in the world has had to determine whether it was of sufficient importance to be developed essentially as an international asset, or whether it was still to be regarded as a small auxiliary service.

All of the first-class governments in the world with the exception of the United States, have determined that aeronautics is one of the most important elements of their defensive and offensive military power, and bids fair in a short time to be one of the greatest assets commercially. Each one of these states, therefore, has provided a central control for the development and administration of all its aeronautical elements, military, civil, commercial and international. The states have so organized their aeronautic departments that maximum economy of administration will be exercised, combined with the maximum development of aeronautics. This can only be obtained by a centralization of control and a continued policy of air development.

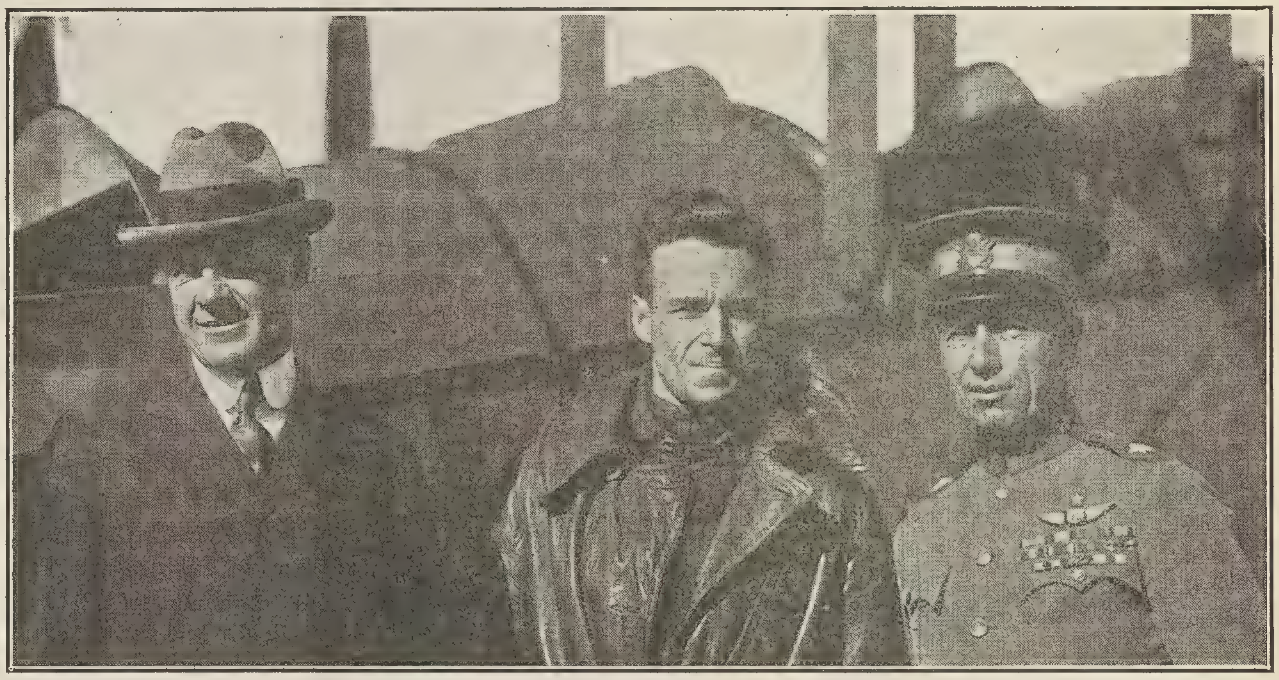
The air service is such a new element in the national defense armament of governments, that the only personnel that are familiar with it to any great extent are those whose business it has been to handle it during the war. It is believed that practically all flying officers are convinced that an air department as provided by the New and Curry bills is the only one that can work successfully in this country and develop aviation in an economical way, considered from a military, civil and commercial standpoint.

It is interesting in this connection to see what the other authorities, aside from the flying officers, advocate in this respect. The Crowell mission which was sent to Europe to investigate areonautical conditions, advocated centralization of control and an air army co-equal with the war and navy departments. Gen. Pershing, in his testimony before Congress, advocated the centralization of control for aviation and the Board of Officers convened by the War Department also advocated a centralization of control.

It is quite evident under these conditions that the thought in this country is following the general lines adopted by other large countries in the development of their aviation, and it remains now for Congress to formulate their basic principles into a law, which it will attempt to do in the coming session.

It is quite evident that the more simple and the more direct the control over all branches of aviation under one department, the more efficient will be its development, because otherwise the War Department, the Navy Department, the Post Office Department, the Treasury Department, the Department of Commerce, the Coast Guard, the Geodetic and Geological Survey, the Public Health Service and all sorts of other organizations will create their own air service with all the overhead that is incident to them and will present so many and so divergent views to Congress as to their necessities as to make Congress bewildered on the whole proposition as it really is at the present time.

What appears to be the most necessary thing now is to educate the people of the country as to what may be expected from aeronautics; how it affects the well-being of this country; what development may reasonably be expected and, among other things, where we would be in case we had a war with a first-class country that had a united air service when we had none.



ASSISTANT SECRETARY OF WAR CROWELL, LIEUTENANT KIRKPATRICK AND GENERAL MITCHELL

[C] *Underwood & Underwood*

Committee on Aeronautics

The whole question of aeronautics is such a broad one that it is believed that the people should insist on having this subject handled by committees on aeronautics in the Senate and House of Representatives, instead of having this question handled as a side issue with other committees such as military, naval, post office, etc., so that the aeronautical question may be considered essential as such and as distinguished from considering aeronautics as an auxiliary to other branches.

During the war a splendid aeronautic personnel was built up in the United States Air Service, which in peace time would have been impossible to do. That personnel is the greatest asset that the country has at present, providing it is utilized before it is too late and organized so that it can be used. Some 15,000 young men received instruction as pilots and observers. Of these, the army has retained less than 900. All of the rest have returned to their civil pursuits most keeping little or no connection with the government. There is no other first-class country in the world that has handled such a great asset in a similar manner. If these young men stay out of the service or out of touch with it for a couple of years, they will cease to be an asset. A great majority are willing and anxious not only to stay in active service but to go into a reserve organization of any kind, which would insure their being federal officers and having something to fly in occasionally.

Reserve Units

With the equipment that is now on hand, these men could be organized into reserve units without difficulty throughout the country and with very little expense. Without a personnel that can fly airplanes and handle them, it makes no difference how many airplanes are on hand, they are useless.

Laws should be made, therefore, which will allow us to hold on to as many of the navigating personnel of the former air service and organize them into reserve units throughout the country as is practicable. This will make the greatest military and commercial aeronautical assets that we can have. Each great city can have its aerodrome and flying unit.

As to material, practically nothing was originally developed in this country during the war with the exception of some motors. The types of airplanes used were entirely foreign in design. What was worked out, however, and what was also a great asset to the country, was an airplane industry, which correspondingly in time of peace could not be worked up any more than the personnel could be, as was mentioned above. This industry is now ready and willing to build American-designed machines for the American units that are now in service. It must be remembered that, if an order is given to the manufacturers today for service airplanes, it will take a year and a half or two years for us to get that same equipment in the hands of the organization, due to the time required for fabrication. At present our air service is equipped with obsolescent machines of foreign design and American construction, or entirely of foreign design and foreign construction, and as things stand, we are entirely at the mercy of foreign manufacturers for the equipment of our air units.

Up-to-Date Airplanes

If we went to war tomorrow with a first-class power, we would have to buy airplanes from England, France, or Germany, because we neither have them nor can produce them sufficiently quick enough ourselves. All other countries have followed out a building program with the object of keeping their means of production in such a condition that it can be rapidly expanded. This has been accomplished by continuing in large part the airplane orders given during the war, and in addition giving smaller orders for the new and up-to-date airplanes, with which a future war will be fought.

Neither of these things has been done in the United States. Aside from the activity the air service of the army has not let itself and a few inventors in this country, we have been at a standstill since November 11th, 1918. It is, therefore, apparent, that unless we retain and maintain our aeronautics at once, the strong potential position from an aeronautical standpoint that we obtained duing the war will be lost and we will practically say to the world at large, "We don't care for any aviation in this country, you can take it." That is about the status of the matter as it stands today.

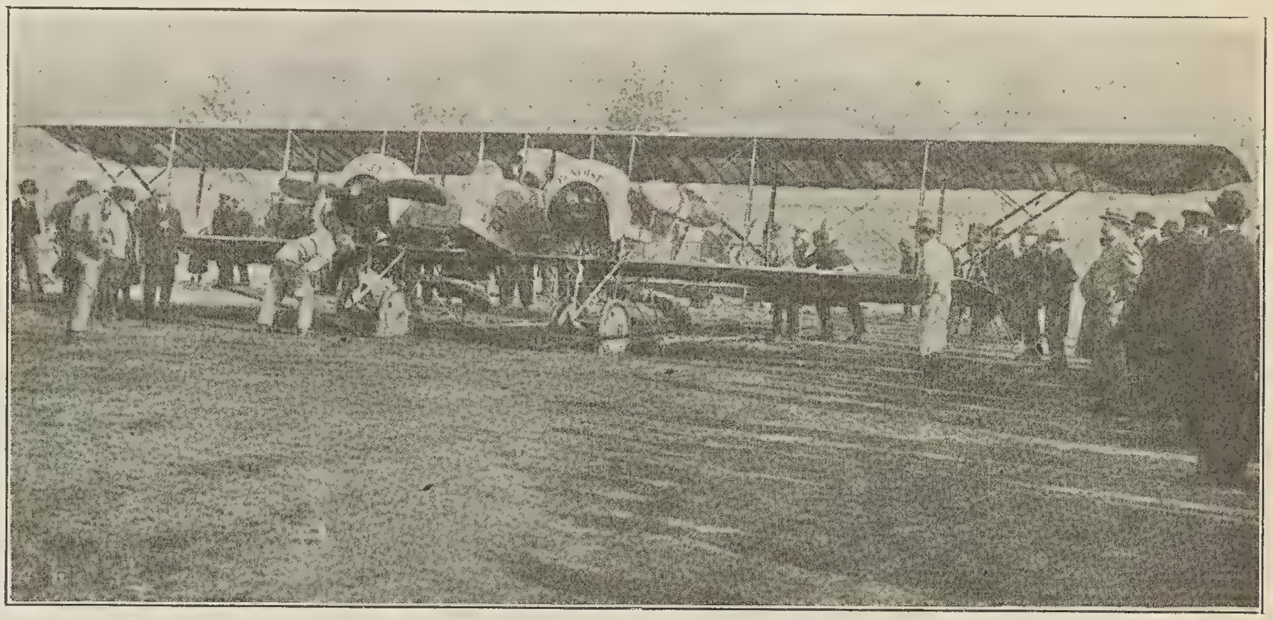
In spite of all the difficulty encountered, the air service of the army has not let itself be deterred by conditions as they were found to exist in this country after the return of the American Expeditionary forces in Europe. It must be remembered that during the war all air operations in this country were on a school basis. That is to say, as many pilots as possible were trained to send to Europe, and as many airplanes were manufactured as could be turned out. Neither this personnel nor this material, however, was organized into active squadrons which could go in the field and act with the army.

On the Mexican Border

When the air squadrons came back from Europe and were demobilized, it left the United States with no air force except unorganized personnel and material. A plan was gotten up so that with the comparatively few officers and men that were left in the air service, a certain number of squadrons could be kept. The names of the old squadrons that had seen the maximum service on the western front were retained in the service and completely reconstituted, with the result that during the last six months a great work has been accomplished, particularly along the Mexican border. The old First Bombardment Group is now on a war basis with all its armament, bombs and guns. The First Pursuit Group with the famous 94th and 95th squadrons are concentrated at Kelly field near San Antonio. Many of the old officers and men are still with it. The First Surveillance Group has been deployed along the whole border from the Atlantic to the Pacific Ocean, and patrols the whole frontier. This has never been done before in our history, and the amount of moral support that has come to the inhabitants and the material efficiency shown by this group in the recent incursions by Mexicans on the border has been very pronounced. In all there are about 300 airplanes in service with all their war equipment down on the Mexican border. This is quite a strong force in itself.

The aeronautic activities in both the coast and the insular possessions have not been neglected, so that no matter what happens to the air service there is at least a framework and a system that can be built on and improved.

The engineering section of the air service has brought out new types of airplanes and thoroughly tested them. These types have been designed to meet the specific requirements necessary for completing up-to-date aircraft that are equal or superior to any aircraft in existence. They are directly American in their manufacture and their construction. It is these aircraft that we are so anxious to have built so as to put into the hands of our squadrons up-to-date aircraft of essentially American-make and up-to-date in every respect.



IN THIS MACHINE POULET AND BENOIT LEFT PARIS FOR AUSTRALIA—THEY WERE LAST REPORTED AT RANGOON, DEC. 1

(C)-Keystone View Co.

The Turbo-Booster

The engineering section keeps in touch with the aeronautical engineers throughout the country and with the production of aircraft, so as to give them the results of their investigations and conclusions and to assist them in the greatest possible way. Among other things on which they are working with great success is the turbo-booster, which makes it possible to deliver more air to the carburetor at great altitudes, where the air becomes rarified. With this device an ordinary airplane has already ascended with a passenger over 30,000 feet and it seems entirely probable that within a comparatively short time an altitude of 40,000 to 50,000 feet will be obtained. It, therefore, seems probable that by the use of the variable pitch propeller which can be set for the maximum climb to get to these high altitudes, and after the altitude has been arrived at that the pitch of the propeller can be changed so as to give the maximum amount of horizontal speed; that the swiftness of locomotion of airplanes at a high altitude will be greatly assisted on account of the lessened resistance of the air and it seems probable that speeds of from 300 to 400 miles an hour may be expected. This, then, would allow an airplane to cross the Atlantic in 6 or 7 hours or almost go around the world in a day. The variable pitch propeller also can be used to slow up the speed of an airplane and to stop it very quickly upon landing. The engineering section has devised and developed excellent parachutes, which have the same relation to the passenger and pilot of an airplane in case of accident high up in the air that a life preserver has to a passenger on a water vessel. It is even more sure in its action than the ordinary life preserver at sea. A landing gear has been applied to a machine which makes it able to come down on water and land on ice or snow. These are only some of the things. New cannons are being fired out of airplanes. Armored airplanes are in the course of construction that are really flying tanks. New cameras, new wireless instruments and a host of other things.

We are perfectly certain, that if a moderately efficient system of development for its aeronautic resources is adopted by the United States, and on account of our mechanical ability, raw materials which are available in this country, means of mnufacture, and splendid climate for aeronautics, that we can lead the world in this science.

Oregon Forest Patrol

As the result of a conference held between Col. H. H. Arnold, Western Department Air Service officer, and Major A. D. Smith, in charge of Oregon forest air patrol, six DeHaviland airplanes were despatched from Mather Field to patrol Oregon forests in the effort to prevent devastating fires.

KING ALBERT'S FLIGHT

Manhattan has had the unique experience of watching the King of the Begians up in the air. For an hour King Albert, accompanied by one of our naval aviators, soared high above the skyscrapers of lower New York and watched the thick traffic in the harbor while he was winged over the world-famed Statue of Liberty.

AIRCRAFT JOURNAL

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THE WORLD'S AIRPLANES AND SEAPLANES

The Pfalz Scout D XII

GROUP 1—NO. 9 THE PFALZ SCOUT D XII

A German single seater whose general characteristics have only now become available is the Pfalz Scout D XII which presents many interesting structural features.

Power Plant

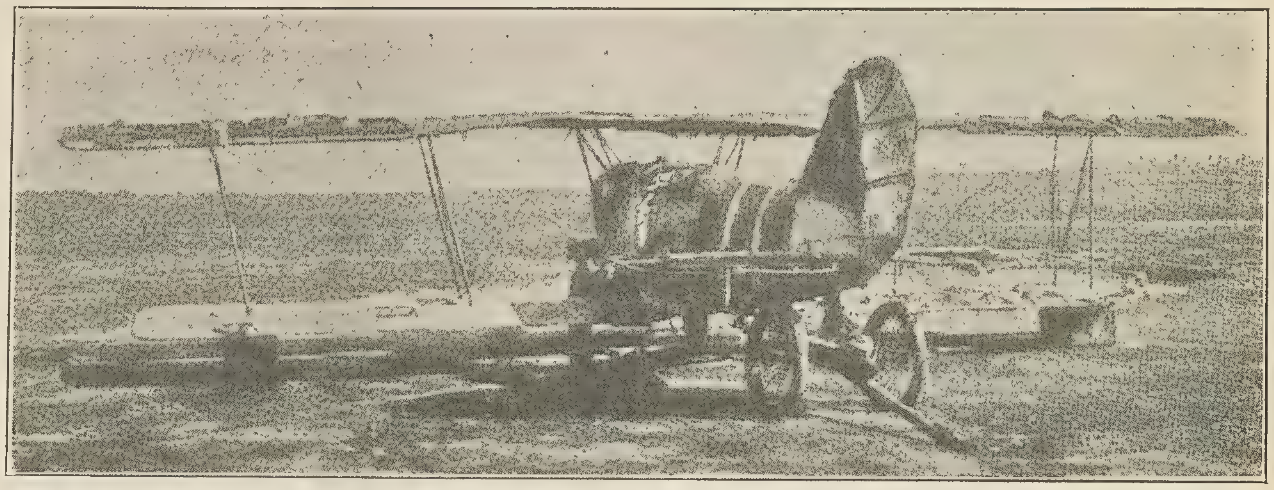
180 horse power 6 cylinder Mercedes
Main fuel tank 16.1 gallons ; Auxiliary tank 2.6 gallons
Oil tank 2 gallons
Air pressure for tanks

Main Dimensions

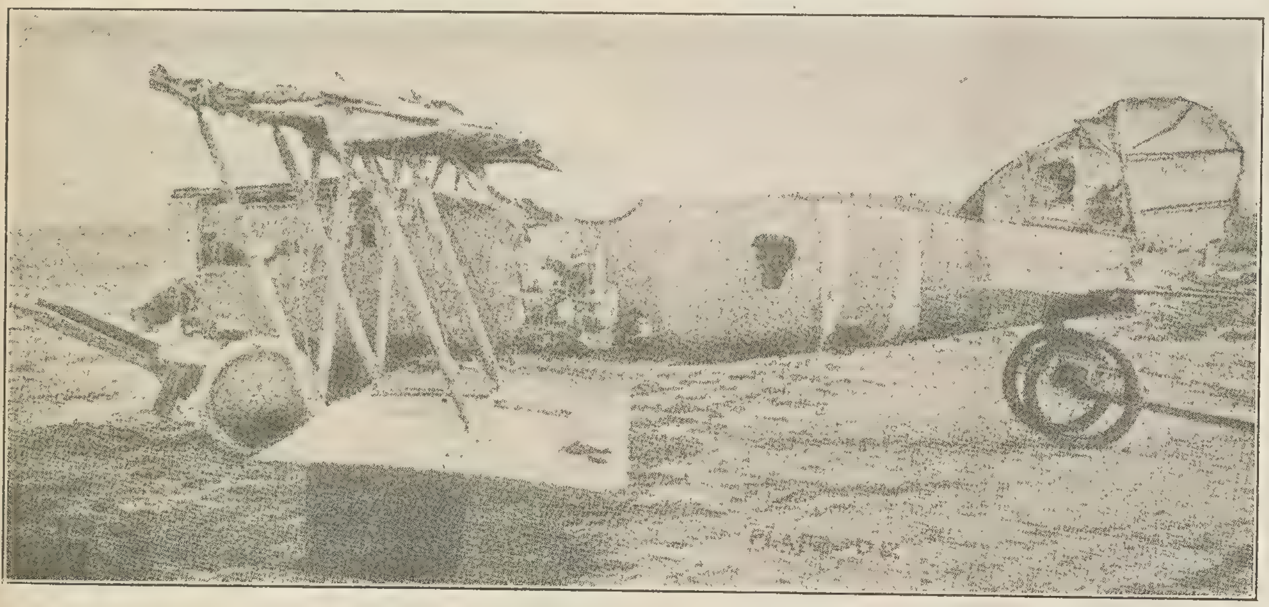
Span (overall)	29 ft. 6 in.
Span (upper plane)	7 ft. 7 in.
Span (lower plane)	26 ft. 4 ins.
Chord (both planes)	4 ft. 7½ in.
Overall length	21 ft. 5 in.
Stagger	1 ft. 4 in.
Gap at inner struts	4 ft. 6 in.
Gap at outer struts	4 ft. 3½ in.
Angle of incidence	3¾ degrees
Dihedral angle (lower plane only)	1½ degrees
Span of tail plane	7 ft. 3 in.
Area of upper wings (without ailerons)	104.8 sq. ft.
Area of lower wings (both)	117.6 sq. ft.
Area of aileron (one only)	8.4 sq. ft.
Area of balance of aileron	.8 sq. ft.
Area of elevators (each)	8.4 sq. ft.
Area of balance of elevator (one)	.6 sq. ft.
Area of rudder	8.8 sq. ft.
Area of balance of rudder	.4 sq. ft.
Area of stabilizer (both sides)	16.0 sq. ft.
Area of fin	4.4 sq. ft.
Area of body (horizontal)	32.8 sq. ft.
Area of body (horizontal)	32.8 sq. ft.
Area of body (vertical)	53.6 sq. ft.

Main Weights

Fuselage, without engine, guns, auxiliary tank or oil tank	257 lbs.
Lower wing (one side only)	46 lbs.
Upper wing	127 lbs.
Radiator	44½ lbs.
Fin	3 lbs.
Aileron	7¾ lbs.
3-ply tail plane	19 lbs.



VIEW OF D XII PFALZ—NOTE RADIATOR AND SLOPING "N" STRUTS



PORT SIDE VIEW OF D XII PFALZ

This machine represents a departure from former Pfalz practice of the radiator installation in the wing to the nose radiator. The flat upper plane is built in one piece and contains neither gravity tank nor radiator. The lower plane, is the same chord as the upper plane and only slightly shorter in span and is faired off into the body in the usual Pfalz way. The wing spars are box type having solid top and bottom and veneer sides.

The ailerons are balanced and are fitted to the upper wings only. They have a high aspect ratio and are constructed of light welded steel tubing. A curved aileron lever is welded to the steel aileron frame, and works in a slot in the wing.

The struts are of "N" shape when seen from the starboard side of the machine and are made of streamline steel tubing.

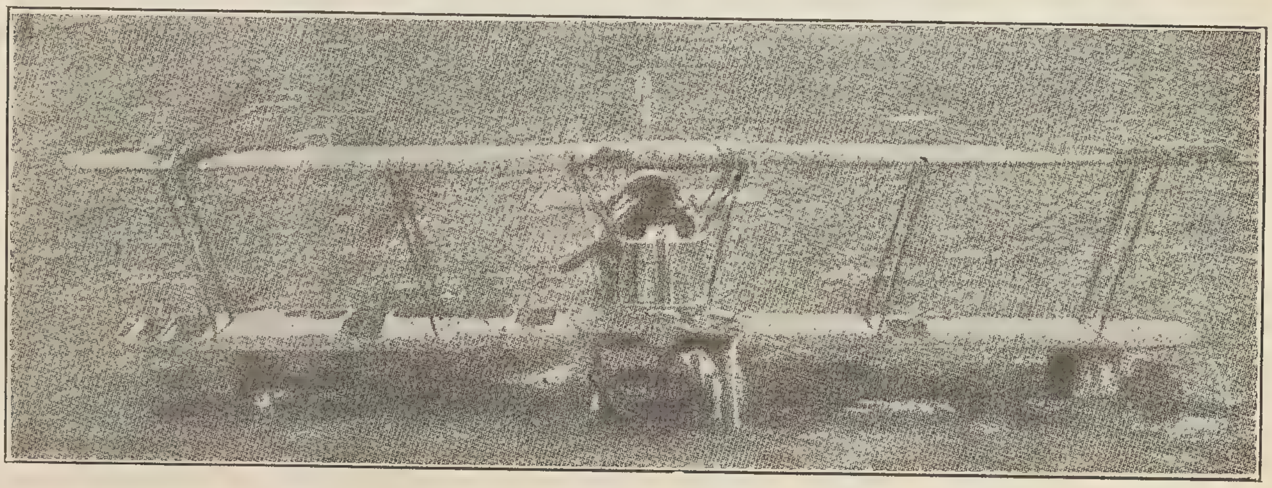
The fuselage is of oval section and has eight lightened longerons to which are fixed lightened cross bulkheads. Over this frame work two thin 3-ply skins are tacked spirally. The body is entirely without internal wire bracing.

The tail surfaces are of welded steel tubing. The camber of the stabilizer is symetrical and its center line is in line with the crankshaft. Both the rudder and elevators are balanced. The tail skid is a sturdy piece of ash with the usual steel shoe and the shock absorber is of double coil steel spring.

The armament consists of two Spandau guns synchronized with the propeller. The triggers are on the control lever. Accommodations are provided for 80 rounds of ammunition.

Want Ladies to Fly

The New York Police Department is about to add women to its force of "sky cops." At least, at the offices of the Police Reserves it is announced that young women recruits between the ages of eighteen and twenty-five are wanted for the Aviation Corps School ,at 156 Greenwich Street. There are at present 110 young men attending the school.



THREE QUARTER VIEW OF THE D XII PFALZ

Notes on Technical Aeronautics

PARACHUTES AND PARACHUTE FLARES

Early in the war several designers produced parachutes for airplanes, but with more pressing work in hand this subject received little attention from the authorities. However, when the German aviators started to use parachutes to escape from their damaged machines, the cry from the allied aviators for some similar equipment became insistent. Experiments were being rushed through when the Armistice intervened and gave pause to what might have been overhasty decisions. These facts and the following possibilities of parachuting are set forth in an article by Lieut. Col. H. S. Holt in a recent issue of the Aeroplane.

There are six axioms that may be predicated safely with regard to parachutes:

(1) The better the design, or theoretic contour of a parachute, the better it will maintain this contour when dropped under load. The worst form of parachute is that which opens to a saucer shape (Fig. 1) and then assumes the shape of Fig. 2 as it begins to drop under load. This puts unnecessary severe strain on the fabric and gives a maximum shock to the passenger.

(2) So long as a good air pocket is maintained in a parachute, the fewer lines employed the better, thus reducing the chance of a tangle to a minimum.

(3) The better the design the less "bellying" or "panelling" there will be at the circumference.

(4) A practical parachute should not require skilled labor to pack it, nor should the process take an undue amount of time.

(5) A good parachute is a compromise of various attributes or qualities.

(6) The nature of this compromise depends on the nature of the work that the parachute is intended for.

One sometimes reads in a report on lifesaving parachutes that a certain type was no good because it opened too slowly, while another was no good because it opened too quickly. In large parachutes there are really two stages in the opening process.

The first stage is when the air begins to get in between the folds of the parachute and separates them. This quicker this happens after the parachute is drawn from its case the better. The second stage is when the parachute begins to expand to its full diameter. The slower this process takes place the better owing to the severe strain on the passenger and fabric which otherwise occur.

It can be readily seen that if a dirigible or balloon becomes disabled in the air the passenger usually has time to release the parachute with comparative safety. This condition does not exist in airplanes owing to (1) high speed, (2) the fact that it may be in almost any position when the aviator is obliged to leave the machine. Originally parachutes were fastened to the machine and released by the pilot's weight, but later designs place the parachute on the passenger's back, and it is released automatically by use of a pilot parachute.

At any rate, the passenger should be a safe distance from the machine before the parachute opens. This is most easily secured when the machine is on an even keel. A passenger knowing this is tempted to leave the machine at the first hint of trouble, whereas if he sticks to the plane he will have probably a very good chance of bringing it safely to earth. So the great problem in parachute designing lies in the possibility of producing a parachute that can be safely launched from an airplane that is in a nose dive or tail spin. The problem is further complicated when it is considered that aside from a possible drop of from 100 to 600 feet before opening the parachute is withdrawn from a machine travelling 80 to100 miles an hour. Owing to this severe strain on the passenger and fabric, shock absorbers are introduced on single parachute systems.

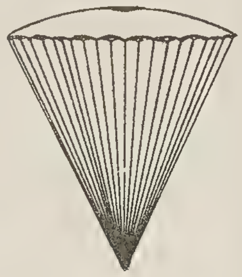


FIG. 1

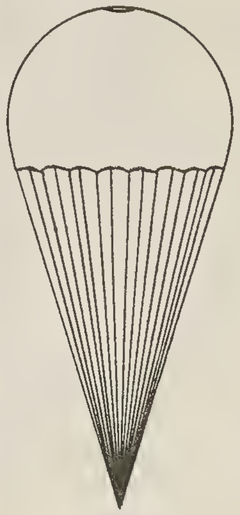


FIG. 2

By experiment it has been found that a parachute loaded with 180 lbs. released from a machine travelling at 90 miles an hour registered a shock of from 250 to 1750 lbs. In single parachute systems the parachute is drawn out from the circumference instead of from the center. This tends to keep the mouth closed and to start suction through the center hole, thereby keeping the inner edges of the fabric together and preventing egress of air and consequent inflation.

Until recently all life-savers were made of very costly China silk, and had the war gone on there would not have been enough of this silk in the world to equip the Allied airmen with parachutes for all of their machines.

Screw Thread Practice

The matters upon which the National Screw Thread Commission recently created by Congress, has been working are of fundamental importance to the automative industry. The Commission has recently issued a progress report of its work, tentative recommendations being made therein as to screw, bolt, nut and pipe thread standards, classification of fits, allowances (prescribed differences in dimensions, the limits of which are prescribed), and tolerances (definite differences in dimensions prescribed).

The commission is constituted of nine members. The chairman of the commission is the Director of the Bureau of Standards. The Army and the Navy have each designated two representatives. The four remaining members of the commission were named by the Society of Automotive Engineers and the American Society of Mechanical Engineers. The act establishing the commission defined as its purpose the ascertaining and establishing of standards for screw threads for use of the various branches of the Federal Government and for the use of manufacturers.

The commission has made a creditable report on systems of threads, together with information, data and specifications pertaining to the manufacture of the threads recommended.

Too much emphasis cannot be put on the fact that the specification and maintenance of proper manufacturing tolerances in any factory have everything to do with attaining economical production and quality of product. It has been recognized that as a class the automotive shops of this country are unexcelled in their work. The automotive manufacturers should and will exercise all vigilance to improve their fine record in this respect. General conditions including competitive manufacture for international consumption, if no other reason, necessitates this.

At the request of the screw thread commission, the Society of Automotive Engineers held a meeting this week for the purpose of securing the best information of a comprehensive nature as to what is most desirable in screw thread practice in the automotive industry. Reports were made on the work of the National Screw Thread Commission, and data secured during the recent visit of the Commission to Great Britain and France were submitted. The meeting, at which President Charles M. Manly of the Society presided, was representative and of great value. Among those present were Morris Thomson, Timken Detroit Axle Co.; Paul W. Abbott, Lincoln Motor Co.; Lyle K. Snell, Willys-Overland Co.; R. P. Smith, Packard Motor Car Co.; W. A. Davidson, The Singer Mfg. Co.; Alexander Taub, General Motors Co.; Wm. Beckman, Duesenberg Motors Co.; Calvin W. Rice, Secretary, American Society of Mechanical Engineers; E. H. Ehrman, Chicago Screw Co.; W. R. Porter, S. S. White Dental Mfg. Co.; C. M. Pond, Pratt & Whitney Co.; A. W. Erdman, Pratt & Whitney Co.; E. C. Peck, Lieut.-Col., Ordnance Department, U. S. A.; Earle Buckingham, Pratt & Whitney Co. and Niles, Bement & Pond; B. H. Blood, Pratt & Whitney Co.; L. A. Fischer, Bureau of Standards; J. B. Thomas, Westinghouse Electric & Mfg. Co.; W. K. Jamison, The Domestic Engineering Co.; L. P. Kalb, Standard Parts Co.; E. Burdsall, Russell, Burdsall & Ward Bolt & Nut Co.; C. F. Clarkson, General Manager, Society of Automotive Engineers, and R. S. Burnett, Standards Manager, Society of Automotive Engineers.

It was decided at the meeting that in order to accomplish the most of value to the automotive industry and to secure the best consensus of opinion for the consideration of the National Screw Thread Commission or any other similar body, the best procedure would be to gather from representative manufacturers in practical shop form definite information as to present practice.

The Society of Automotive Engineers is assured of the support of the manufacturers in its field and has enlisted the services of men of excellent training and long practical experience in screw thread and shop work to act as its committee to direct the collection and analysis of the industrial data mentioned. This committee consists of Paul W. Abbott (Chairman), Lincoln Motor Co.; R. P. Smith, Packard Motor Car Co.; Lyle K. Snell, Willys-Overland Co.; Alexander Taub, General Motors Co., and W. K. Jamison, Domestic Engineering Co.

BREESE JOINS LOENING

Robert Potter Breese, who, during the war, was officer in charge of the engineering department of the Air Service at Hazelhurst Field, Mineola, has joined the engineering staff of the Loening Aeronautical Engineering Corporation of New York.

NEW R. M. A.

Second Lieut. James F. Armstrong, Air Service, Aeronautics, having completed the required tests, is rated as a Reserve Military Aviator, to date from October 9.

Trade Review

DOW METAL—A NEW LIGHT ALLOY

Heretofore magnesium has not been used extensively for purposes where mechanical strength is important. Recent developments in the production of alloys of magnesium, however, have opened the way for many applications of this remarkable metal, particularly in automobile and aeroplane construction. In this connection, the attention of engineers is called to a casting alloy recently developed by the Dow Chemical Company of Midland, Michigan, and known as the Dow Metal, which marks a considerable advance in the field of light-weight alloys.

This new alloy has a specific gravity of 1.80, combined with a tensile strength of over 20,000 lbs. per square inch. When subjected to a certain heat treatment, this strength may be increased to 28,000-30,000 lbs. per sq. inch. It may be cast either in sand or metal molds. The castings resemble malleable iron in being unusually tough and resistant to shock. While possessing only about one-half the tensile strength of malleable iron, Dow-Metal, being only one-fourth as heavy, is really twice as strong for an equal weight.

To illustrate the strength of the Dow-Metal the following test was made. A cylindrical casting, 3 inches in diameter by 3 inches long, closed at one end, and having walls 3-16 inch thick, was subjected to compression lengthwise. It required 40,000 lbs. to deform the casting and 68,000 lbs. to break it. Before breaking it was compressed 9 per cent. of its original length, and, when rupture occurred, it did not fly to pieces but broke along two cracks on opposite sides and extending only two-thirds of its length.

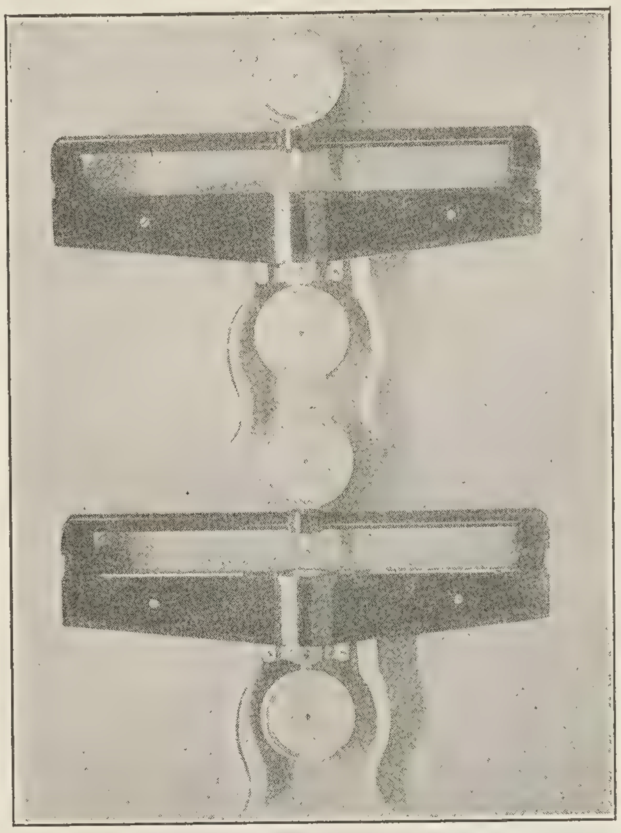
Dow-Metal has been tested extensively in pistons for automobile engines, with highly satisfactory results, these tests having been run in several types of engines, over many thousands of miles under all manner of road conditions. Equipped with these pistons, the engine has run more quietly and with less vibration, has quicker acceleration, while about a twenty per cent. increase in mileage per gallon of gasoline has been obtained. At the same time some disadvantages which have accompanied the use of other light weight piston alloys in the past, have been overcome.

The Dow Chemical Co. purposes to develop the use of its alloy in castings for pistons and other machine parts, where lightness is essential. A special research department has been organized to carry on this work, and the staff is engaged in working out the problem connected with the production of castings, and with the further development of magnesium alloys. They will be pleased to receive suggestions or inquiries from those interested in aeroplane construction relative to the possible uses of Dow-Metal castings in aircraft. The combined strength and lightness of this alloy will suggest many possible uses for it.

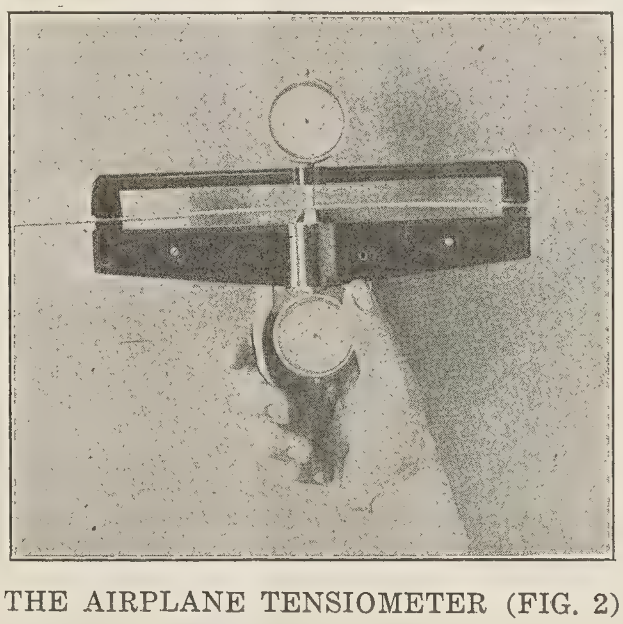
E. C. BURDICK,
Chief Metallurgist, Magnesium Division,
Dow Chemical Co., Midland, Mich.

THE AIRLPANE TENSIOMETER

Light weight is an essential factor in the design of modern airplanes, especially those for military purposes, for which speed and maneuvering ability are of great importance. With the best grade of materials and careful designing the light weight desired can be obtained, but only by using an excessive factor of safety. Under such conditions accidental or careless over-loading of the airplane members must be avoided.



THE AIRPLANE TENSIOMETER (FIG. 1)



THE AIRPLANE TENSIOMETER (FIG. 2)

Certain parts of an airplane are subjected not only to the stresses imposed by the aerodynamic or flying load, but also to the initial stresses, caused by the tension in the stay and drift wires. An appreciable initial stress in these wires is necessary to maintain the alignment of the machine. In many cases the initial stresses have been found to form too large a proportion of the total load. Failure of the structure in service has resulted from an improper adjustment of the turnbuckles. They secured what they considered the proper uniform tension by the "feel" of the wire or by listening to its vibrant sound when plucked with the finger. Either of these methods is obviously crude and inaccurate owing, among other things, to the widely varying diameter and length of the wires. Some experiments have shown that wires thus adjusted for equal tension have really varied by several hundred per cent. A dangerous condition may thus be developed by causing overloading of airplane members through adjustment of initial tension. This emphasizes the need of an apparatus to determine accurately the load in a flexible tensile member.

Several instruments for this purpose have been devised, but most of them are inaccurate, cumbersome, or require the services of an experienced person for their successful use. The Tensiometer, on the other hand, is simple in construction, accurate and easily and quickly operated even by inexperienced persons.

Two sizes of the instrument are shown in figure 1. One is suitable for wires up to one-fourth inch in diameter and the other for wires from one-fourth to three-fourths inch in diameter.

The instrument consists essentially of a frame with supports spaced 10 inches apart, between which a section of the wire or cable is adjusted. Midway between these supports, and operated by hand grips, is a plunger which deflects the wire 0.1 inch from its normal position. The operation of deflecting the wire compresses a calibrated spring. A dial indicator measures the deformation of the spring and thus the load on the wire. One revolution of the indicator pointer corresponds to a load of 1,000 pounds, and the smallest dial division, to a 10- pound load.

The Tensiometer is made direct reading by graduating the indicator dial upon the loading spring so as to read tension in the wire instead of load upon the spring. A second dial indicator allows the simultaneous determination of the deflection to the nearest 0.001 inch. The use of these two sensitive indicators for accurately determining the position and load upon the wires is, in a great measure, the reason why accurate results are obtained with the Tensiometer.

The theory upon which the instrument is based is very simple. If a wire, under tensile stress, is supported at two points and loaded at the middle of the span thus formed, a system of three forces in equilibrium is established. If the span and deflection are kept constant, as in this instrument, the deflecting force is a constant fraction of the tension in the wire.

In use it is never desirable to attach the Tensiometer to the wire. It is simply put into place as shown in figure 2 and the grips brought together until the proper deflection is obtained. The tension in the wire is then read from the other dial, which gives the value directly in pounds.

SHIPS FOR SPOKANE FLIERS

Ex-army fliers in Spokane, Wash., will probably be furnished with airplanes and facilities for carrying on flying at home, according to J. C. Ralston, chairman of the aviation committee of the Spokane Chamber of Commerce. The planes are to be furnished as part of the plan of the Army Air Service to keep ex-army pilots in practice and for which purpose the service is petitioning Congress for funds.

The number of ex-army pilots in Spokane and the natural facilities for flying make it probable that Spokane will be one of the stations to be maintained by the government under the new plan.

L. D. GARDNER. . *President and Editor*
W. D. MOFFAT. . . . . . *Vice-President*
W. I. SEAMAN. . . . . *Treasurer*
H. M. WILLIAMS. . . . *General Manager*

AIRCRAFT
JOURNAL

G. H. DICKINSON. . . *Managing Editor*
ALEXANDER KLEMIN. *Aeronautic Editor*
LADISLAS D'ORCY. . . *Aerostatic Editor*
GEORGE NEWBOLD. . *Business Manager*

Formerly Air Service Journal

Scientific Investigation in Engine Work

IN aeronautical work it may be safely said that the scientific method of investigation has had the fullest possible scope.

Whether the most important progress has been realized by wind tunnel methods or by the cut and try methods of practical construction, it is difficult to decide, but certainly the scientific workers have done much useful service. Their attitude of mind has also had a decided influence on workers in closely allied fields.

For example in a recent British investigation into air cooled engines, conducted by Dr. T. E. Stonton, the following ultra scientific method was adopted in investigating the cooling properties of the radiating fins. Metal rods of circular cross section were rigidly attached at one end to one of the cylinders of the engine, first when the engine was running at various speeds; secondly when the engine was at rest and the root temperature of the rod was maintained at the value which it had in the running test, by means of a heating coil wound round the rod at its base. Similar observations were made on the radiating fins of the engine. Emissivity-coefficients were calculated for surfaces at rest and under vibration and variation in emissivity coefficients with temperature were obtained.

Measurements and apparatus were of the most refined character.

Such refined physical investigation is a direct derivative of the aeronautical influence, and engine development may ultimately be based on work of as strictly a scientific character as that of wind tunnel investigation.

Pilots

IN a recent article Glenn H. Curtiss tells us, with every appearance of being right, that instead of having an almost indefinite reservoir of pilots, as a result of the eight or nine thousand trained during the war, we have on hand a constantly diminishing supply.

While eight or nine thousand aviators do not constitute a large number, many of the war pilots have long since left flying; and there are still a good many planes flying in this country.

When the signing of the armistice brought a temporary depression in aeronautical circles, some of even the veteran pilots of pre-war days decided they would take up other pursuits.

Flying schools are scarce, and are poorly attended.

With no definite government licensing system, new pilots may be extremely well trained at reputable flying schools, or they may have a few hours in the air, and the unjustified confidence of the beginner.

Mr. Curtiss certainly does well to draw our attention to this condition, and to urge inspection of schools, the training of more men, and the licensing of pilots.

The Flying Boat

AT least where aeronautics are concerned the British think "'Imperially". They are continually referring to air trips to Capetown, to Australia; and they harp on the advantages of the flying boat in this connection—apparently with considerable reason.

While a flying boat suffers from an inability to alight on land, with comfort, nevertheless it can do so in difficulty without much damage or danger to the occupants, as actual experience has shown.

No matter how undeveloped the country over which it flies, there are always rivers and lakes on which it is possible to land or make a get away.

In a route over sea, the only competitor is the comparatively slow-going ship. And in seaworthiness, the flying boat greatly surpasses the float sea-plane.

The great space of the hull has enabled, in a recent British design, provision to be made for smoking cabins, a salon, sleeping berths and the carrying of fifty passengers.

There is no doubt that the British are right when they consider the flying boat as a real link in their immense Empire.

German Aeronautical Efforts

WHILE in the terms imposed on the Germans very severe restrictions were placed on the building of military aircraft, it is quite clear that they are developing commercial aircraft at least as rapidly as any of the Allies.

We know that they have giant machines in actual use of at least 1200 horse-power; that they are employing a central power plant, with one propeller geared to four engines; that they have flown machines equipped with a variable pitch propeller equipped with turbo-booster and that they are developing a multiple engined central power plant machine of 2200 horse-power. They are now organizing a complete net work of commercial air routes radiating from Berlin to numerous ports on the frontier and linking up all the chief ports. At the present moment Germany owns, it is estimated, no fewer than 20,000 airplanes. An Airmen's Union has been formed, the effect of which will be to keep German aviators combined in an organization ready for mobilization.

Combination Airplanes

THE trials of a combination land and sea plane have brought up many questions as to the utility of such aircraft. The advantages must be great for any airplane to be fitted with floats.

Although this makes it slower and less manoeuverable than land machines, this particular type has the advantage of being able to get off the land and return to its field or make a landing in the water.

Taking off from the water and landing at a field is problematical as yet so that to get the full value of the type it will have to be employed on fields near the sea or other bodies of water.

Instead of using seaplanes entirely and pending the development of amphibians the navy is using the land type for work with the fleets, without hoping for the return of these craft to their starting point, but to ships fitted with landing platforms. Experimental work is also being done on inflatable floats attached to the landing gear which will permit landing on water. These floats, being compact when deflated, will not impede the speed of the airplane.

New developments of this character are certain to bring about progress in design and make aircraft have a wider usefulness. Encouragement should be wholeheartedly given to the constructors who may by their resourcefulness produce a type that will extend aeronautic utility.

New Plan for Industry to Support Education

Massachusetts Institute of Technology
Introduces a System of Co-operation

The Massachusetts Institute of Technology, Cambridge, Mass., is just beginning to approach the industries of the country with a plan of co-operation which, while it has for its immediate objective the raising of funds to provide more nearly adequate salaries for the members of its instructing staff, is not only almost revolutionary in character, but is bound to have far-reaching effects on the educational structure of the nation.

Briefly stated, the Technology Plan of Education, as it is called, consists of the Institute being retained in a consultant capacity, on an annual salary basis, by the various industries. In return for the fee, Technology agrees to permit the corporations retaining her to make use of the Institute's extensive library, files and plant, and to consult with members of her staff and faculty on problems pertaining immediately to the business of the company. In addition the Institute will place at the disposal of these industries a record of the qualifications, experience and special knowledge of her alumni which is likely to be of value to them, will advise and assist the various companies in obtaining information as to where special knowledge and experience in any given subject may be obtained, and will give them the first opportunity of securing the services of Tech men.

Necessitated by Time

Technology's Plan was really necessitated by the element of time which governs certain large bequests made to her, and is designed to eliminate the delay, which would be fatal, were certain large corporations, who actually want to give to Tech, compelled to await the action of their stockholders, as would be necessary were the contributions to take the form of a gift. One contribution of $3,000,000 is made directly conditional upon Technology's raising a like amount by January 1, 1920.

At various times, a question has been raised as to the legality of gifts made to Educational Endowment Funds by corporations acting without the express consent of their stockholders, and the Technology Plan is, in its first aspect, a method by which such gifts may be legally made, since according to its provisions, the endowment takes the form of a fee, given for services rendered. In other words, the entire Institute is retained in the same manner as though it was a private firm of consulting engineers.

Considered in its broader aspect, however, the Technology Plan is essentially the Americanization of a German idea In Germany both the technical school and the industry were subsidized by the government and both, in the sense and to the extent that they were subsidized, were absorbed by the government. The result was the welding of a homeogenous mass, whose value to the German game of Welt-Politik was manifest long before the war, and which was wholly responsible for the advantages gained by the Central Powers in the early years of the struggle. The great defect in the German system was its autocratic nature and the Technology Plan might be described as the democratization of an autocratic idea.

Technology's Plan is based upon the principle of reciprocity. The nation's strength lies in the nation's industries and the industries depend upon the technical schools for their leaders. To quote Matthew C. Brush, President of the American International Shipbuilding Corporation: "Not therefore on the basis of charity, sympathy or philanthropy, should individuals or concerns assist in the maintenance of the Institute (M. I. T.) but for the purely selfish reason of maintaining their respective businesses at a high commercial and profitable standard."

COMMANDER A. K. ATKINS, U. S. N.

Commander A. K. Atkins, U. S. N., was graduated from the Naval Academy in 1905. *Served at sea on various ships and ashore at the Navy Department until* 1911. *Post graduate course in engineering (specialized in internal combustion engines), Naval Academy, Annapolis, Maryland,* 1912 *and* 1913. *Served at sea until* 1917 *when ordered to the Navy Department, Bureau of Steam Engineering, in connection with Aviation. During the war served as a member of the Joint Army and Navy Technical Board, Joint Army and Navy Airship Board, and the Aircraft Board.*

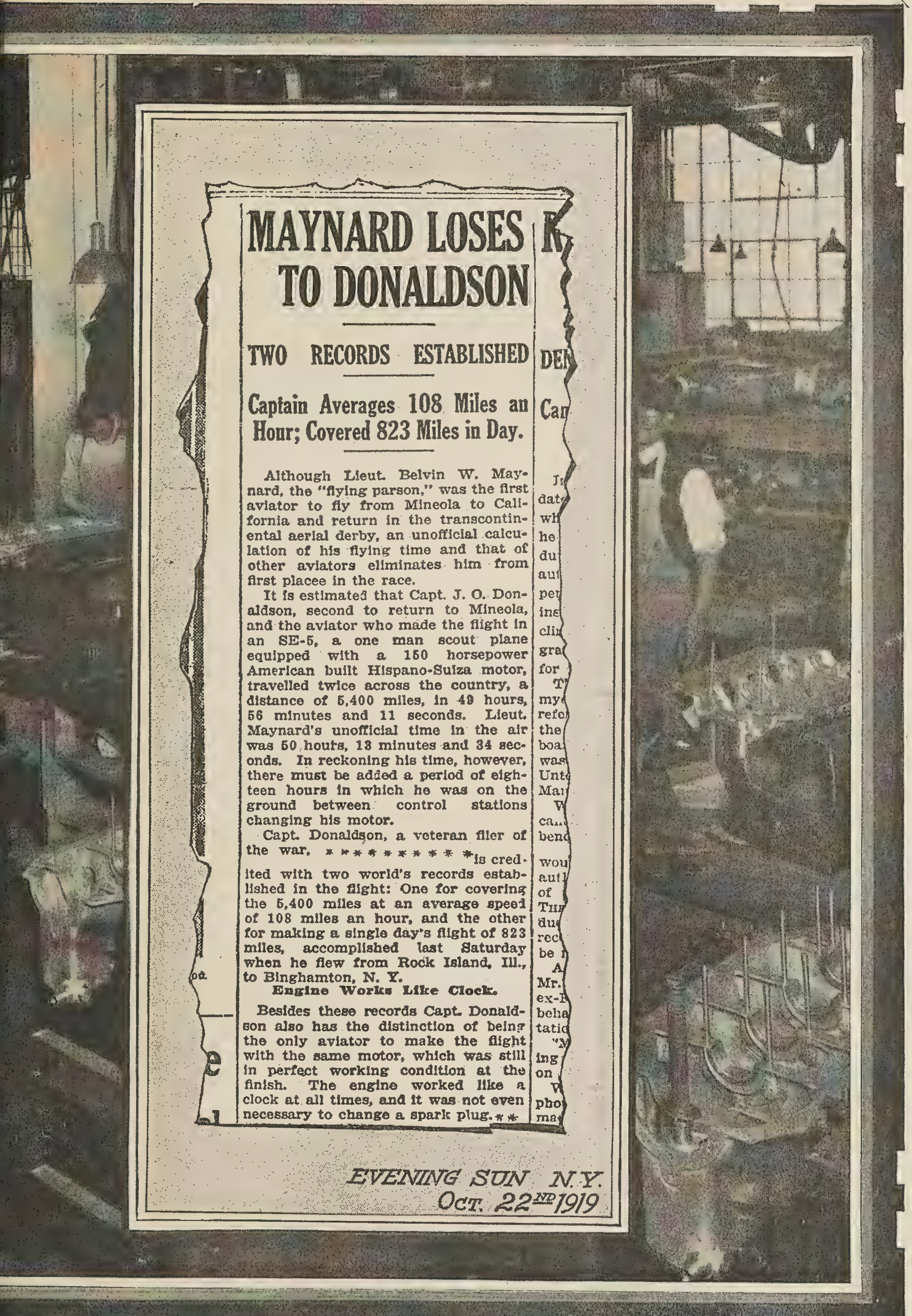
[C] *Harris & Ewing*

In effect, Technology says this to Industry: "This Institute is a source of supply for the most important element in your organization—trained men. We have furnished the men to whom you turn for new and more efficient methods of production. Your need for men such as we produce is constantly increasing. If this school is to furnish its quota of these men, funds are necessary. Therefore, it is for you, who gain most from the efforts of technically trained men that we expect to raise the major portion of the money and in order that your contribution to the fund may be above suspicion of charity or philanthrophy, we will contract to render certain specific services in consideration of an annual retaining fee."

Like many another idea, humble in its beginnings, the Technology Plan may run to lengths far beyond its original scope. It is a perfectly logical conclusion for instance, that ultimately Technology would be retained by the majority of larger corporations just as they now retain great lawyers or great engineers. In return for the retainer fee, they would receive the potential value of the name and reputation of the Institute with its great plant and laboratories, its library, one of the most famous of its kind in the country, the services of its instructing staff and the benefit of the advice of the experts in various fields of engineering who are among its Aumni. In thesis work investigations by undergraduates, preference would be given problems which confronted the corporations and concerns who retained the Institute, and it is quite conceivable that a student might undertake

(Continued on page 12)

HISPANO-
SUIZA
Aeronautical
Engines
Manufactured by
Wright-Martin
Aircraft Corporation
New Brunswick, N. J.
LOWER HALF CRANKCASE
STUD ASSEMBLY



MAYNARD LOSES TO DONALDSON

TWO RECORDS ESTABLISHED

Captain Averages 108 Miles an Hour; Covered 823 Miles in Day.

Although Lieut. Belvin W. Maynard, the "flying parson," was the first aviator to fly from Mineola to California and return in the transcontinental aerial derby, an unofficial calculation of his flying time and that of other aviators eliminates him from first placee in the race.

It is estimated that Capt. J. O. Donaldson, second to return to Mineola, and the aviator who made the flight in an SE-5, a one man scout plane equipped with a 150 horsepower American built Hispano-Suiza motor, travelled twice across the country, a distance of 5,400 miles, in 49 hours, 56 minutes and 11 seconds. Lieut. Maynard's unofficial time in the air was 50 hours, 13 minutes and 34 seconds. In reckoning his time, however, there must be added a period of eighteen hours in which he was on the ground between control stations changing his motor.

Capt. Donaldson, a veteran flier of the war, * * * * * * * * * * is credited with two world's records established in the flight: One for covering the 5,400 miles at an average speed of 108 miles an hour, and the other for making a single day's flight of 823 miles, accomplished last Saturday when he flew from Rock Island, Ill., to Binghamton, N. Y.

Engine Works Like Clock.

Besides these records Capt. Donaldson also has the distinction of being the only aviator to make the flight with the same motor, which was still in perfect working condition at the finish. The engine worked like a clock at all times, and it was not even necessary to change a spark plug. * *

EVENING SUN N.Y.
OCT. 22ND 1919

Plan for Industry to Support Education

(Continued from page 9)

and complete a lifetime of work in any of the branches of engineering without ever actually terminating his immediate connection with the Institute. That such a case is well within the realm of the possible, is evidenced by the fact that already, one of the courses in Electrical Engineering provides that the students who elect that course and are accepted, shall spend one-half of the last three years of a five-year course in the employ of one of the great manufacturers of electrical machinery.

A Great Consulting Body

Carried to its conclusion, the Technology Plan would make of M. I. T. the greatest consulting body in the world, since its range would cover practically every field of technical research and it would follow, that since the great corporations of the country retained Technology as a Consultant, the great experts of the country would ultimately be members of its instructing staff. In other words, industry would, in a sense, come to Technology, instead of the instructing staff and students going to Industry, as they do now in certain cases.

It is therefore quite likely that a new relationship between Technology and the industrial organization of the country, will grow out of the Technology Plan. American industry has long been in need of a clearing house of scientific knowledge. The unparalleled resources of M. I. T. are to be placed more than ever at the command of the nation's business and what the step will mean for the development of American enterprises in every field of endeavor can scarcely be overestimated. The position the United States is to hold in the commerce of the world will depend in a large measure upon the degree to which science is applied to the processes of production and it is technically trained men who will meet and solve the problems of international competition.

Fears that the Technology Plan may conflict with the work of the privte consulting engineer, are answered by the obvious fact that the great majority of the problems submitted to the Institute are beyond the scope of the private engineer or laboratory.

The Technology Plan owes its inception to the efforts of a group of Tech's Alumni to raise $4,000,000 for an endowment fund, a sum which the "Mysterious Mr. Smith, already Tech's benefactor to the extent of $7,000,000, has promised to duplicate. What American industry will owe the Massachusetts Institute of Technology as the result of the plan, is a question for the next ten years to answer. One immediate result of its adoption is, that carried to success and its full fruition, it will make Technology independent of personal bequests and free her from the necessity for periodic appeals to the state or general public for monetary aids.

Form of Agreement

Here is the form of agreement:

Agreement made this.............day of .....19.... between .... hereinafter referred to as the Company, and the Massachusetts Institute of Technology.

The Company agrees to pay to the Massachusetts Institute of Technology the sum of .... Dollars, in five installments of..................., payable on the first day of January of each year from 1920 to 1924 inclusive.

The Massachusetts Institute of Technology agrees to permit the Company, during the five years of 1920 to 1924 inclusive, to use its library and files, and to confer with its technical staff on problems pertaining to the business of the Company.

The Massachusetts Institute of Technology further agrees to maintain a record of the qualifications, experience and special knowledge of its alumni that shall be as complete as practicable, and upon request to advise and assist the Company to obtain:

Information as to where such knowledge and experience are available.

Information regarding men for special problems.

Information regarding men for permanent employment.

The Massachusetts Institute of Technology further agrees to maintain a list of undergraduates who may wish positions upon graduation; to advise the Company upon request as to the records and qualifications of these men, and to arrange for interviews with them.

In case the company has special technical problems, requiring investigations, tests or research, the Massachusetts Institute of Technology agrees to advise the Company where this work can best be done, whether in Technology's laboratories by its own staff and students, or by some outside organization.

....

By...

MASSACHUSETTS INSTITUTE
OF TECHNOLOGY

By...

What the "Post" Did

[Editor Ernest L. Haight in the Highland, N. Y., "Post."]

Business in the office of the Post has been booming for the past four weeks with a big "B." As announced in the issue of November 21st, the "AIRCRAFT JOURNAL" of New York City is being issued from this office.

It came about in this way. Herbert M. Williams, who is general manager for the Gardner-Moffat Company, publishers of two semi-monthly, one weekly, and one monthly publication, came to Highland to talk the situation over with the editor of the Post, when the New York strike was holding their work up. Mr. Williams had employed Mr. Haight some twenty years ago in New York City on small publication work.

As a result of the visit the work of getting out the weekly paper, "THE AIRCRAFT JOURNAL," was planned for. The plant of the Highland Post was readjusted for the new work with regular metropolitan speed. An additional working force was put on as soon as labor conditions made it possible to get the help. The midnight illumination gleamed in the office many a night, and by day the rumble of the press and the merry jingle of the linotype has made music that a proprietor who enjoys "doing things" likes to hear. The work of printing, folding, stapling, and mailing the periodicals, and incidentally to catch up the back issues from October first, has kept from five to seven extra hands at work. And Mr. Williams has called into play his early knowledge of the craft, and has "made up forms" with precision and persistence.

The presswork produced by Pressman Goldt on the time honored Campbell Oscillator is such that the office management is not the least bit ashamed of it—in fact considerably gratified over it. The fifth and sixth issues are now on the journey through the presswork avenues.

While the rush and the go of the proposition have made very busy times, yet to meet the representatives of the Gardner-Moffat Company has been a real pleasure.

Mr. Williams, the manager, has already made many friends in town. Henry T. Munch, the expert bindery man, made lasting friends the while he industrially set himself to the task of getting his branch of the work started. The editor, G. H. Dickinson, a man of wide acquaintance and of varied experience, having carved out a journalistic career of far more than ordinary note, it has been a privilege to know and converse with.

George Newbold, the advertising man, sojourned in town the first of the week, just long enough for an acquaintance that pointed out his genial attitude and suggested his especial qualifications for his work.

And Fred Nidlund, the generally dependable office man, who came up from the New York office to tackle the trimming and mailing job when Mr. Munch was called back to the city—well, Fred is a young man after any appreciative employer's heart.

Busy the office has been, breakdowns and minor acidents have happened. The regular and original business of the plant has been delayed little. These delays for the Post—have been due to accidents and breakdowns, rather than because of tackling the additional work.

And as the editor pens this (or pencils it, rather), the press is cheerily turning out a sheet of excellent half-tone illustrations; the linotype, with Operator Doheny at the keyboard, is singing a merry jingle; the mailing department with Mrs. Schumacher and Mrs. Gedney is getting material ready to fill the yawning mail sacks; the indispensible Foreman Clearwater is giving his uncomparable attention to the abundant Christmas advertising for the Post; Miss Raymond is on the alert for that late news item; Manager Williams' genial attitude never alters during his work; and—

Well, the whole hustle and bustle sounds good—mighty good!

FOR CALIFORNIA AIR MAIL

Representative Randall of California has introduced the following bill, which was referred to the Committee on the Post Office and Post Roads and ordered to be printed:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Postmaster General be, and he is hereby, authorized to expend, out of any unappropriated balance of the appropriation "for inland transportation by railroad routes and airplanes," appropriated by the Act entitled 'An Act making appropriations for the service of the Post Office Department for the fiscal year ending June 30, 1920, and for other purposes,' approved February 28, 1919, for the purchase of aeroplanes and the operation and maintenance of aeroplane mail service between the cities of New York, and San Francisco, California, by way of Chicago, Illinois, Kansas City, Missouri, Wichita, Kansas, Albuquerque, New Mexico, Prescott, Arizona, and Los Angelos, California, and the Postmaster General is authorized to designate such additional points between said cities as he may deem necessary or advisable for the operation and maintenance of an aeroplane mail service between said additional points, to be included in the service to and between said cities of New York and San Francisco, California.

SPOKANE DOCTOR FLIES

Flying for sport is the newest development of aviation at Spokane, Wash. Three machines are plying in Spokane on a commercial basis. Now comes the sportsman-aviator. Dr. R. A. Hahn, a physician, and C. K. Lewis, manager of the Armour plant here, have joined forces for the purchase of an airplane to be used exclusively for pleasure. Neither is an experienced aviator, but both have enrolled in the flying school.

WINTER HANGARS

Write for particulars

BAKER & LOCKWOOD MFG. CO.

KANSAS CITY, MO.
7th & Wyandotte Sts.

BROOKLYN, N. Y.
473 Kent Avenue

CHICAGO, ILL.
3021 Michigan Avenne

THE HOME INSURANCE COMPANY NEW YORK

ELBRIDGE G. SNOW, *President*

Home Office: 56 Cedar St., New York

AIRCRAFT INSURANCE

Against the Following Risks

1. FIRE AND TRANSPORTATION.
2. THEFT (Of the machine or any of its parts).
3. COLLISION (Damage sustained to the plane itself).
4. PROPERTY DAMAGE (Damage to the property of others).

SPECIAL HAZARDS

Windstorm, Cyclone, Tornado—Passenger Carrying Permit—Stranding and Sinking Clause—Demonstration Permit—Instruction Permit

AGENTS IN CITIES, TOWNS AND VILLAGES THROUGHOUT THE UNITED STATES AND ITS POSSESSIONS, AND IN CANADA, MEXICO, CUBA, PORTO RICO AND CENTRAL AMERICA

Aircraft, Automobile, Fire and Lightning, Explosion, Hail, Marine (Inland and Ocean); Parcel Post, Profits and Commissions, Registered Mail, Rents, Rental Values, Riot and Civil Commotion, Sprinkler Leakage, Tourists' Baggage, Use and Occupancy, Windstorm

STRENGTH REPUTATION SERVICE

Changes of Station

Orders have been requested of the Adjutant General for the following named field officers to change station as follows:

Major Thomas G. Lanphier, J. M. A., Infantry, from Washington, D. C., to March Field, Riverside, California.

Major Maxwell Kirby, J. M. A., S. C., from Hazelhurst Field, Mineola, Long Island, N. Y., to Washington, D. C.

Major Howard C. Davidson, J. M. A., S. C., from Washington, D. C., to Dayton, Ohio.

Major John W. Simons, Jr., J. M. A., A. S. A., from Park Field, Millington, Tenn., to Washington, D. C.

Major Clarence H. Maranville, A. S. A., from Army Balloon and Airship Detachment, Akron, Ohio, to Army Balloon School, Fort Omaha, Nebraska.

Major Robert Soubiran, A. S. A., from Hazelhurst Field, Mineola, Long Island, N. Y., to Kelly Field, San Antonio, Texas.

Major William A. Robertson, S. C., from Rockwell Field, San Diego, Cal., to Mather Field, Sacramento, Cal., to assume command.

Major Lawrence S. Churchill, S. C., from Love Field, Dallas, Texas, to Americus, Ga., to assume command.

Lieut.-Col. Charles C. Benedict, A. S. A., from Washington, D. C., to Dayton, Ohio.

Lieut.-Col. Rutherford B. Hartz, A. S. A., from Anacostia, D. C., to Dayton, Ohio.

Lieut.-Col. Lawrence W. McIntosh, A. S. A., from Ellington Field, Houston, Texas, to Dayton, Ohio.

Lieut.-Col. Ira A. Rader, A. S. A., from Souther Field, Americus, Ga., to Dayton, Ohio.

Major Walter H. Frank, A. S. A., from Washington, D. C., to Dayton, Ohio.

Major Albert L. Sneed, A. S. A., from Washington, D. C., to Dayton, Ohio.

Lieut.-Col. John S. Sullivan, A. S. A., from Langley Field, Hampton, Va., to Dayton, O.

Lieut.-Col. Joseph T. McNarney, J. M. A., A. S. A., from Godman Field, Camp Knox, Stithton, Ky., to Gerstner Field, Lake Charles, La., to assume command.

Major John W. Simons, J. M. A., A. S. A., from Washington, D. C., upon completion of his temporary duty, to Buffalo, N. Y.

Major Frank D. Lackland, J. M. A., S. C., from Ellington Field, Houston, Texas, to Aviation Repair Depot, Montgomery, Ala., to assume command.

Major Jacob H. Rudolph, A. S. A., from Ellington Field, Houston, Texas, upon completion of his temporary duty, to Aviation Repair Depot, Speedway, Indianapolis, Ind., to assume command.

Major Junius H. Houghton, J. M. A., S. C., from Kelly Field, San Antonio, Texas, to Scott Field, Belleville, Ill., to assume command.

Major Ora M. Baldinger, A. S. A., is relieved from further duty at Washington, D. C., and will proceed from St. Paul, Minn., where he is now on temporary duty with the All American Pathfinders, to Taylor Field, Montgomery.

Major Elbe A. Lathrop, A. S. A., from Air Service Mechanics School, St. Paul, Minn., to Washington, D. C.

Major Clinton W. Russell, J. M. A., A. S. A., is relieved from further duty at Call Field, Wichita Falls, Texas, and directed to proceed upon expiration of his present leave of absence, to Barron Field, Everman, Texas, to assume command.

Major John G. Thornell, A. S. A., from Langley Field, Hampton, Va., to Brooks Field, San Antonio, Texas, to assume command.

New Spad Records

A new official world's record for speed flight was made recently at Villa Coublay, France, when a Spad one-place plane flew at a speed of 184 miles an hour over a marked course, according to word received by the Manufacturers' Aircraft Association. The record is announced as official by the aeronautical section of the French army. The Spad carried a 300 h.p. Hispano-Suiza engine.

At the same time a Spad two-place plane, carrying a passenger weighing 160 pounds, traveled at a speed of 175 miles an hour over the course.

These records have both been surpassed by unofficial American records.

One of the fastest flights for two passengers was made when Lieut. Philip Lucas, formerly adjutant of Bolling Field, with Col. M. A. Dargue, Department of Military Aeronautics, made the flight from New York to Washington in 80 minutes at a speed of 178.5 miles an hour, exceeding the new French record by 3.5 miles per hour. Lieut. Lucas flew a DeHaviland 4 equipped with a 400 h.p. Liberty engine. This record was made March 6, 1919.

With a favoring wind Col. Walter G. Kilner, passenger Major Albert Smith flew 115 miles from Riverside to Rockwell Field, California, in 38 minutes, at a speed of 180 miles an hour. This flight was also made in a DeHaviland, February 21, 1919.

The fastest one-man flight ever recorded was made on January 25, when Lieut. Robert B. Baker flew from Fort Sill to Oklahoma City, Okla., ninety miles in 22 minutes, at an average of 245.4 miles an hour. Unfortunately this record was not official though it was well attested by air service officers.

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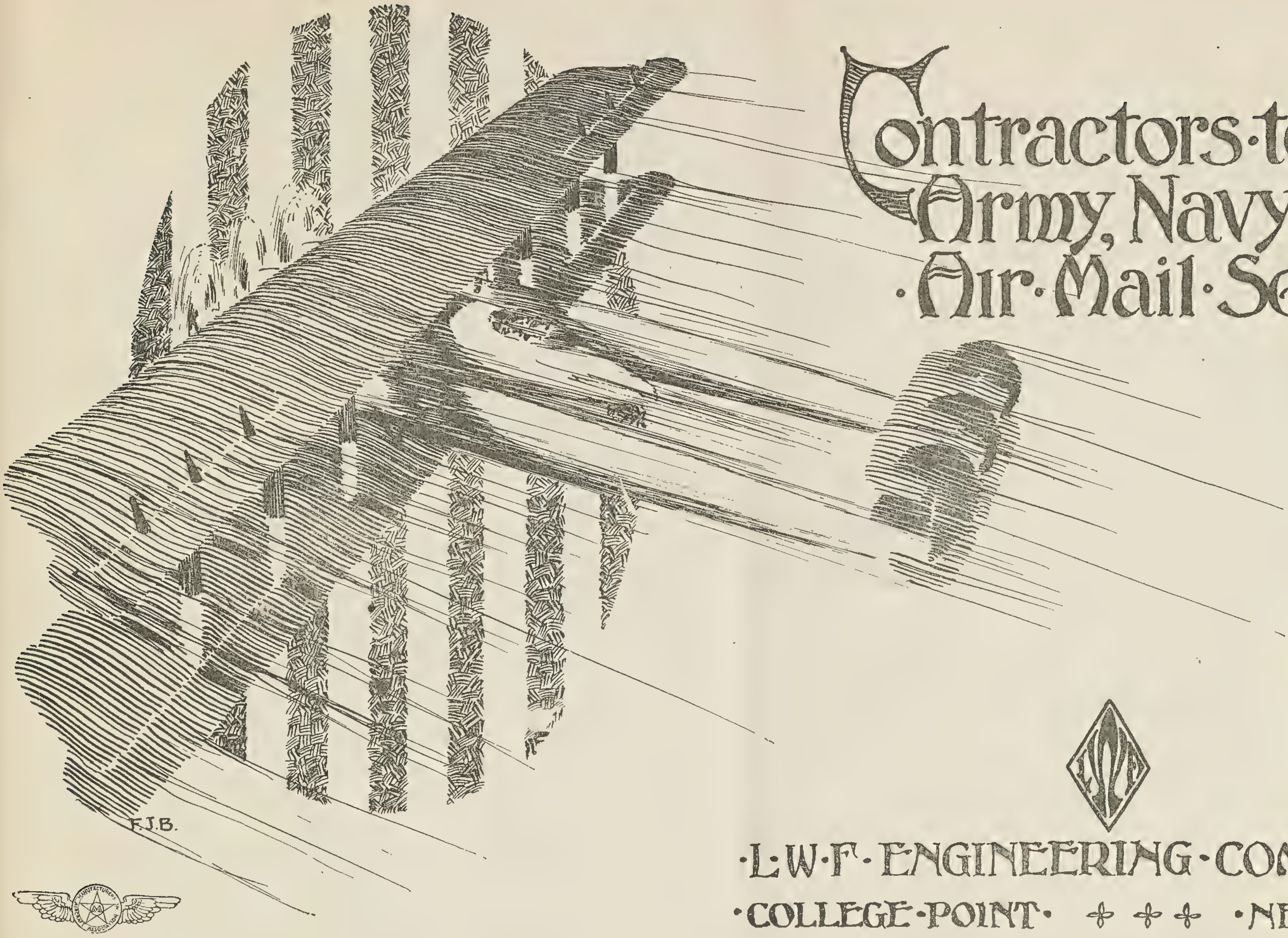

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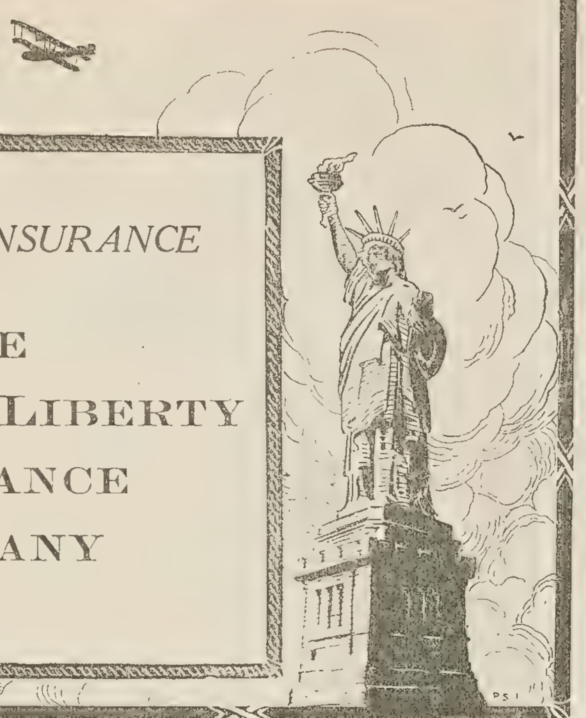

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Airplane Safety

The next decade promises to produce a commercial development of the airplane far surpassing the achievements of the war period, great as these have been.

Those interested in the development of aeronautics must, however, be fully alert to present-day limitations in order that the development may be along lines productive of the highest achievement and the greatest safety.

Public interest is the most valuable asset possessed by those interested in aeronautics today. It is vital that it be maintained and educated in the right direction.

Aviation appeals to the ideals and imagination of the people. Unfortunately, however, it must be recognized that the average man regards aviation as exceedingly dangerous, and to attain full popular support we must make aviation more safe and then educate the public to the true state of affairs.

Every serious accident is published on the first page of all newspapers throughout the country. It is, therefore, of utmost importance that during the commercial development era we are entering, all possible means be taken to eliminate accident and recognition given the fact that public support will be in inverse ratio to the number of serious accidents recorded. Fatal accidents may be grouped in three general classes: First—Failure of the pilot; second—failure of the plane, and third—failure of the power plant.

Failure of the pilot is the most difficult to guard against. The bureau charged with granting civilian licenses is, however, insisting upon a high standard of personal efficiency. This must be rigidly maintained.

Failure of the plane is exceedingly rare. Recent statistics show that only seven of 288 fatalities were caused in this manner. In this respect it must be recognized that this risk in standard types of planes is practically negligible, and that practically all of such failures occur in experimental planes. The public should be brought to an understanding and recognition of these facts and be taught to differentiate between standard proven types and experimental designs.

Failure of the power plant resulting in accident is more frequent. This necessarily results from the conflicting demands of reduced weight and increased power. Stresses on the high-powered airplane engine and high-speed propellers are enormous. Breakage of propellers and crankshafts are consequently still comparatively frequent.

The solution of this problem is two-fold. First, by improved design and material, to reduce the danger of such breakage; and secondly, by the employment of the automatic ignition interrupter to limit the serious consequences of such breakages when they do occur.

Serious consequences from breakages of this nature are due to the unbalanced torque under the continued development of power. In many cases the pilot cannot act quickly enough to prevent serious damage, and even fire, and hence the necessity of adopting an automatic device to accomplish this end.

The interrupter has been in use by the Navy during the last ten months, and officers who have had experience with it have expressed the opinion that it is an absolutely essential safety appliance.

A description of this instrument appeared in the March 1 issue of *Aviation* and *Aeronautical Engineering*. It is essential that every means possible be taken to safeguard aviation and the use of the automatic ignition interrupter should be insisted upon.

When the public begins to realize that a trip by airplane can be made with comparative safety, if the proper precautions are taken, the interest now being manfested in aeronautics will assume a tangible aspect, and will hasten the day when the United States can assume her rightful position as the pioneer and leader in aerial navigation, and assure to her people the vast benefits that may be reasonably expected to accrue.

Book Review

(The "Battle of Chatillon," a graphic history of the Second Corps Aeronautical School, American Expeditionary Forces, printed by the Dean-Hicks Company, Grand Rapids, Mich., under the direction of Lieut. Donald B. Wurzburg.)

This extremely interesting book was published by members of the Second Corps Aeronautical School at Chatillon-sur-Seine, France. It is in the form of a graphic or pictorial history of the school, and, although published primarily for the men who were stationed at Chatillon, it is interesting as an indication of the spirit of the Air Service in general and of the Second Corps School in particular.

The text, cartoons and photographs are all the work of the men of the school, and it was practically all one in France.

The book has not been placed on the market, and only sufficient copies have been printed to cover the subscriptions taken in France. Perhaps it will be of more interest to the Second Corps school than to anyone else, but, at the same time, from a military standpoint, it contains a series of very useful notes.

The remarks on the training of an observer, infantry liaison, artillery adjustment and other matters are interesting and pertinent. The book also gives a very complete idea of the organization of an aeronautical school of this character. It would be of particular interest to any exeutive officer in charge of such a school.

It is hoped that the Dean-Hicks Company will be able to supply the book to military men specially interested, to whom such a book would be of real value.

Thomas

THOMAS-MORSE AIRCRAFT CORPORATION
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Coombs Recognized

The Contest Committee of the American Flying Club has announced ratification of an American closed circuit airplane speed record of 139.6 miles per hour made by Master Signal Electrician Clarence B. Coombs, United States Air Service, made with a DeHaviland-4 biplane equipped with a 400-horse power Liberty motor.

This record was made in the competitive speed race run October, 1918, between Belmont Park and the Statue of Liberty during the aerial carnival held at the Belmont Park Course on Oct. 26. The distance covered in this closed circuit was 35.9 miles. The remarkable time of 15 minutes 31 seconds was made, bettering the previous American speed record for a closed circuit by 12.2 miles per hour.

The race was a one class affair with seven De Haviland 4 starters. The field was sent away abreast from a spectacular standing start. In a driving finish Sergt. Coombs, the Hazelhurst Aviation Field representative, crossed the line first, not over fifteen feet above the race course and nosing out the runner-up by less than one airplane length.

Sergt. Coombs, who was disqualified in the New York-Toronto International Aerial Derby for reported failure to circle one of the control fields in effecting a landing, has been reinstated, as it was proved that he had observed all the rules during the contest.

BOYCE-VEEDER CORP.

Harrison H. Boyce of the Moto-Meter Company, Inc., Long Island City, N. Y., has formed a new company, the name of which will be the "Boyce-Veeder Company", having its factory and office in Long Island City, for the marketing of an automatic and hand operating fire extinguisher especially applicable to motor cars, trucks, tractors, aeroplanes, and other automotive vehicles.

The new company will operate under the "Erwin" patents, and the device is said to be of a very novel and most meritorious nature.

Associated with Mr. Boyce will be Paul L. Veeder, an attorney well known in both New York and Chicago.

Offices have already been opened in the Queens Subway Building, Long Island City. It is stated that the production will be in full swing January 1.

Mr. Boyce plans to divide his time between the new organization and the Moto-Meter Company, Inc.

A NEW SPARK PLUG TESTER

This accessory has been designed by Leo Ripault & Co., London. It entirely does away with the screw driver method of removing a plug, and possibilities of shock.

It consists of a piece of fibre having two metal strips which are held in place by four screws, two of which are of a special length for the spark gap.

This tester is suitable for any style of plug. It is very handy, very simple and very sure—made suitable to carry in the pocket and of high grade finish throughout.

CITY COLLEGE COURSE

A new course entitled "Aeroplane Motor Design" has been added to the curriculum at the College of the City of New York. This makes the sixth aeronautic course to be established there, the others being Aeroplane Design, Aeroplane Drafting and Mechanical Inspection.

The new course embraces the theory and practice of the design of internal combustion engines, with special reference to aeronautic motors.

Altitude Apparatus

In a recent issue of L'Aerophile, Dr. Guglielminetti discusses the possibility of constructing special cabins for carrying passengers at high altitudes. With the use of the turbo-compressor and the maintenance of engine power with altitude, it will be possible to fly at tremendous speed in the rarefied regions of 20,000 feet or thereabouts. The problem of such special cabins becomes an important one therefore.

There seems to be no insuperable difficulty in the construction of a cabin in which passengers would always find the same atmospheric conditions as at ground level. The pressure would be maintained by an air pump; heating and ventilation would offer no insuperable difficulties. The structural difficulties present in the submarine where pressure of three or four atmospheres have to be met, would not have to be faced in aerial navigation where half an atmosphere would be about the maximum to be considered.

As early as 1903 such a cabin was suggested by M. DeFonvielle before the Societe Francaise de Navigation Aerienne, to be attached to a free balloon.

At high altitudes the aeronaut was to descend through the manhole ("tron d'homme") into the air tight cabin. A safety valve (soupape de surete), an air pump, compressed oxygen underneath the cabin proper, a hot water system complete the simple apparatus.

SPERRY INSTRUMENTS

Arrangements have been completed whereby the Sperry Aircraft Instruments, formerly manufactured and sold by The Sperry Gyroscope Company, will now be manufactured and sold exclusively by Sperry Instruments, Inc, Farmingdale, Long Island, N. Y.

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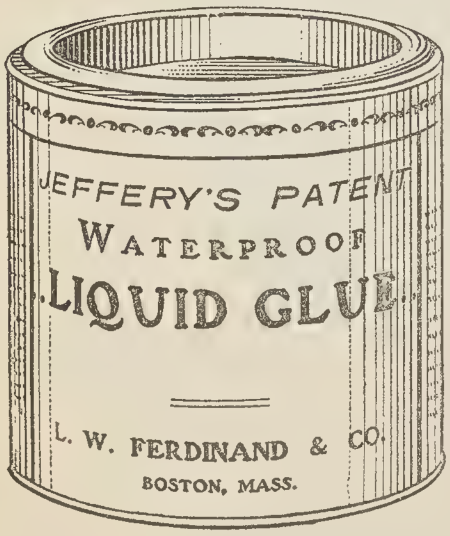

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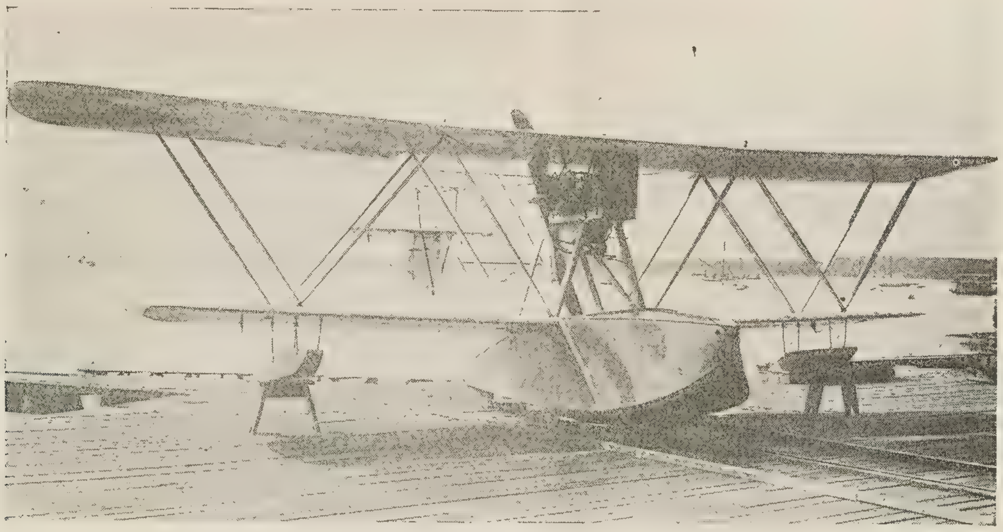

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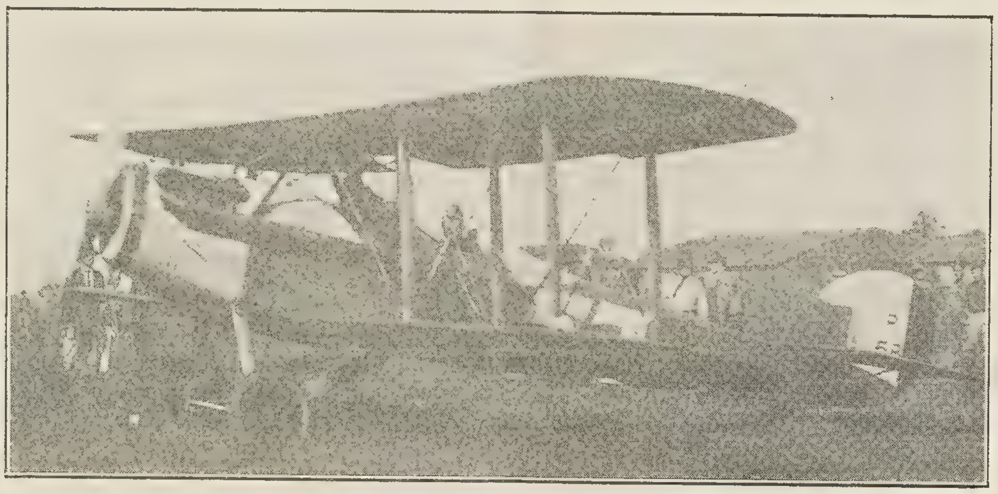

- ¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.
- ¶ Adopted by U. S. Army Air Service as the Standardized Advanced Training Type.
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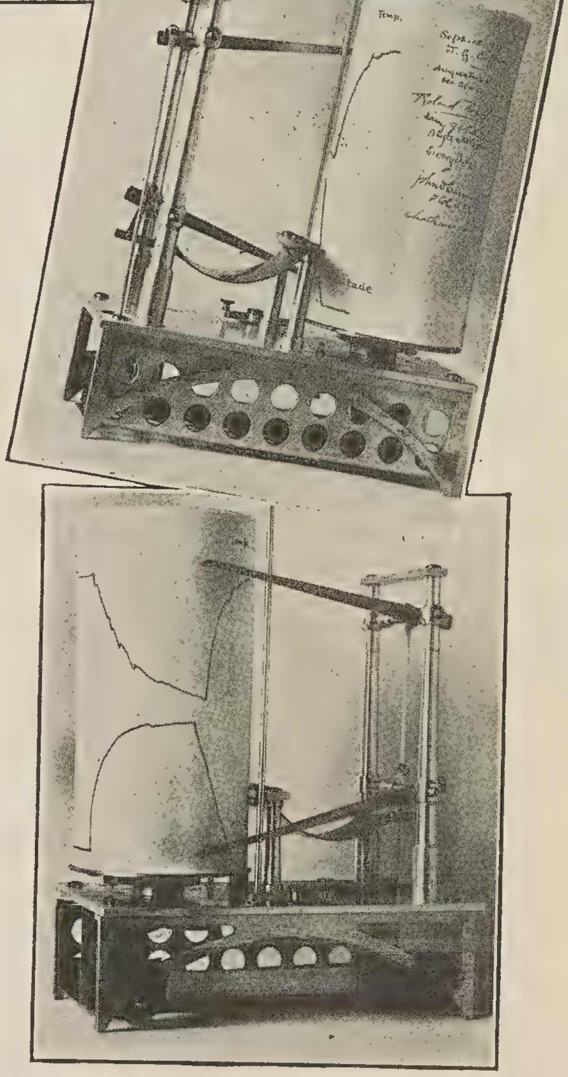

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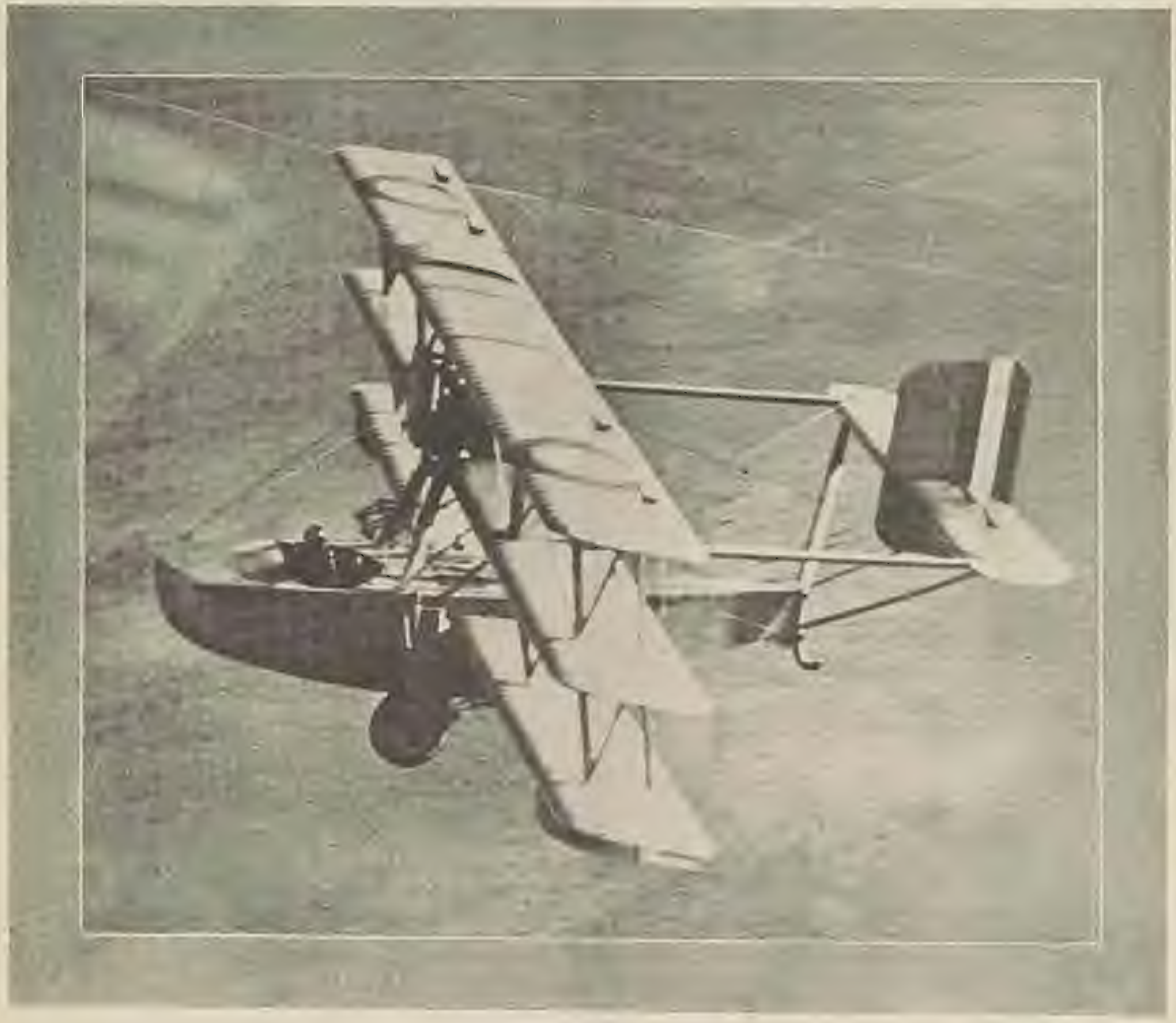

This New Type of Flying Boat Is Being Tested for the United States Navy and It Probably Will Be Used at Coastal Flying Stations

(C) *Wide World Photos*

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

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Deeds and Insignia of Air Squadrons

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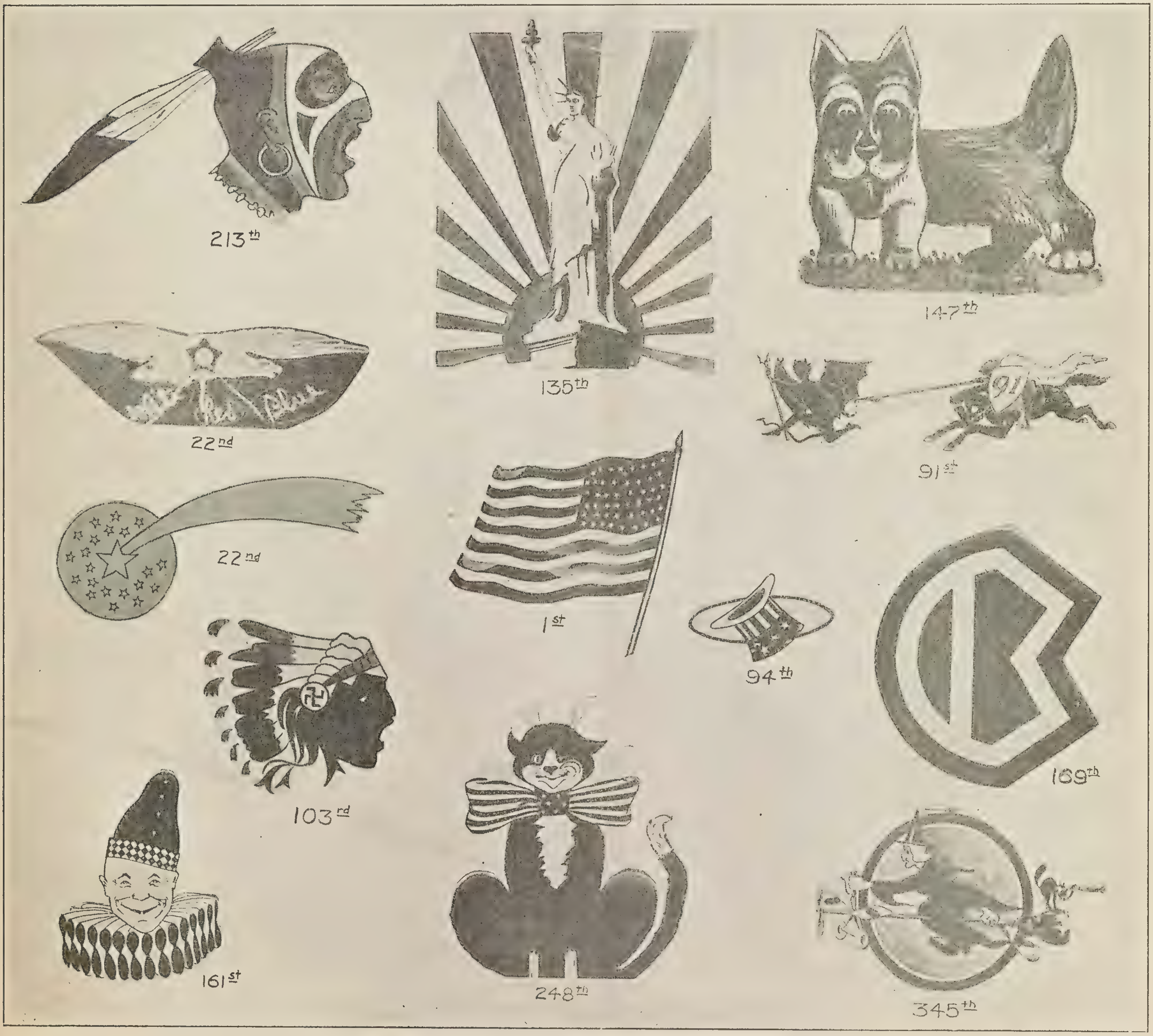
Devices for Forty-Four of the Units Approved by the Secretary of War

The Secretary of War has approved the insignia for forty-four airplane squadrons, submitted by the Director of Air Service. These insignia are for use only on planes and on baggage for the purpose of distinguishing the different squadrons, and will not be worn as shoulder insignia by individnals. They comprise the insignia used in the A. E. F. by the squadrons actually organized in France, which saw action at the front. The insignia selected for the First Aero Squadron is the American flag.

First—The First Aero Squadron was operated as a Corps Observation Squadron. It arrived on the front at Ourches April 4, 1918, and was assigned to the First Corps April 8, 1918. The First was engaged in the operations in the Toul Sector, Chateau-Thierry, St. Mihiel, and the Argonne-Meuse first and second offensives, and after the armistice it was assigned to the Army of Occupation on Novmber 20, 1918. This squadron suffered 26 casualties, consisting of 15 killed, 8 wounded, 2 prisoners and 1 missing. Having engaged in 94 combats it was officially accredited with having shot down thirteen enemy aircraft. The First Air Squardon was a continuation of the First Squadron in the United States Air Service beginning its service on the Mexican border.

EIGHTH—The insignia for the Eighth Aero Squadron is a great American eagle, with the wings spread, holding the American Liberty Bell.

The Eighth Aero Squadron was of the



INSIGNIA OF THE A. E. F. AERO SQUADRONS

Corps Observation type. It arrived on the front at Ourches on July 3, 1918, and was assigned to the 4th Corps, Observation Group, 1st Army, on August 14. The Eighth was engaged in the operations in the Toul Sector, Chateau-Thierry, St. Mihiel, and the Argonne-Meuse first and second offensives, terminating its work on February 5, 1919. It suffered twelve casualties, consisting of 4 killed and 8 prisoners.

NINTH—The insignia for the Ninth Aero Squadron is a silhouette showing the beams of three search lights pointing upward and forming the numeral IX.

The Ninth Aero Squadron was organized as a Night Observation Squadron. It was assigned to the 1st Army Observation Group August 26th, 1918, and reached the front at Amanty on August 28. The Ninth was engaged in the operations at St Mihiel and the Argonne-Meuse first and second offensives. During this time it made 70 reconnaissances into the German lines, engaged in numerous combats but never received official confirmation for any victories. It received its demobilization orders May 1, 1919. The squadron suffered six casualties, consisting of one killed, 4 wounded, and 1 prisoner.

ELEVENTH—The Eleventh Aero Squadron is represented by a cartoon of Mr. "Jiggs" carrying a bomb under his arm.

The Eleventh Aero Squadron was a Day Bombardment Squadron assigned to duty in the First Day Bombardment Group, First Army on September 5, 1918. It had already reached the front at Delouze on August 26th. The Eleventh was engaged in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. It made 32 bombing raids, engaged in 17 combats and received official confirmation for 13 victories. It ceased operations December 11, 1918. The Squadron suffered 20 casualties, consisting of 10 killed, 1 wounded, 8 prisoners, and 1 missing.

TWELFTH—The Twelfth's insignia is not given.

The Twelfth Aero Squadron was a Corps Observation Squadron. It was assigned to the First Corps on April 30, 1918, and three days later, May 3rd, reached the front at Ourches. This squadron was engaged in the operations in the Toul Sector, at Chateau-Thierry, St. Mihiel and the Argonne-Meuse first and second offensives. During its long period of activity it engaged in numerous reconnaissances, fought many combats and received confirmation for three victories. The Twelfth suffered heavy casualties, consisting of 8 killed, 9 wounded, and 4 prisoners. It received its demobilization orders April 1, 1919.

THIRTEENTH—The insignia for the Thirteenth Aero Squadron shows the figure of death depicted by a skeleton running at full speed with a bloody scythe in his hand.

The Thirteenth Aero Squadron was a Pursuit Squadron. It was assigned to the Second Pursuit Group, First Army on June 28, 1918, reaching the front the same day. It engaged in the operations in the Toul Sector, at Chateau-Thierry, St. Mihiel, and the Argonne-Meuse first and second offensives. During this period it made 179 patrols and War Missions, fought 89 combats and received official confirmation for 29 victories. It ceased operations on December 5, 1918. The Thirteenth suffered 13 casualties, consisting of 5 killed, 1 wounded, and 7 prisoners.

SEVENTEENTH—The insignia for the Seventeenth Aero Squadron is the great snow owl flying through the air, ready to pounce upon the enemy.

The Seventeenth Aero Squadron was a Pursuit Squadron, assigned to the Second Army on November 4, 1918, and reached the American front at Toul on the same day. This squadron had been assigned first to the Royal Air Force on July 15, 1918, and had operated with them until November. During its period of activity it had engaged in 110 combats, and received official confirmation for 5 victories. The Seventeenth ceased operations December 11, 1918. Since July it had suffered 24 casualties, consisting of 10 killed, 5 wounded, 7 prisoners and 2 missing.

TWENTIETH—Three legs in a circle arranged in pin wheel fashion comprise the insignia adopted by the Twentieth Squadron.

The Twentieth Aero Squadron was a Day Bombardment Squadron. It was assigned to the First Day Bombardment Group, First Army, on September 5, 1918, and reached the front at Amanty two days later. It was engaged in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. It carried on numeroous bombing raids into German territory, engaged in eleven combats and received confirmation for eleven victories. The Twentieth received demobilization orders on December 11, 1918. This Squadron suffered 25 casualties, consisting of 13 killed, 3 wounded, 8 prisoners and 1 missing.

TWENTY-SECOND—A number of stars in a ring with a large star with a tail, evidently a comet, superimposed, represents the 22nd Aero Squadron.

The Twenty-second Aero Squadron was a Pursuit Squadron. It reached the front at Toul on August 16, 1918, and on August 22nd was assigned to the Second Pursuit Group, First Army. It was engaged in the operations in the Toul Sector, at St. Mihiel, and in the Argonne-Meuse first and second offensives. During its period of activity it performed 117 patrols and war missions, fought 90 engagements, and received official confirmation for 46 victories. It ceased operations April 4, 1919. It suffered 9 casualties, consisting of 6 killed, 2 prisoners and 1 wounded.

TWENTY-FOURTH—The Twenty-fourth Aero Squadron is represented by an American eagle pouncing upon the German daschund which is running away with its tail between its legs.

The Twenty-fourth Aero Squadron was an Army Observation Squadron. It was assigned to the First Army Observation Group on August 1, 1918, and reached the front at Condreville on August 22nd to take part in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. Before the armistice it had carried out mre than 80 reconnaissances, fought 54 combats and received official confirmation for 12 victories. The Squadron suffered 7 casualties, consisting of 1 killed, 1 wounded, 3 prisoners and 2 missing. On April 10, 1919, it was assigned for further duty to the Army of Occupation.

TWENTY-FIFTH—A cartoon of a masked headsman with an ax is the insignia used by the Twenty-fifth Aero Squadron.

The Twenty-fifth Aero Squadron was a Pursuit Squadron. It was assigned to the Fourth Pursuit Group, Second Army, on October 22, 1918, and reached the front at Toul two days later. It was engaged in the operations of the Argonne-Meuse second offensive. It had been operating but a few days when the armistice was declared, and had not received confirmation for any victories. Neither had it suffered any casualties.

TWENTY-SEVENTH—The 27th Aero Squadron insignia comprises another form of the American eagle, superimposed upon a large round spot.

The Twenty-seventh Aero Squadron was a Pursuit Squadron. It was assigned to the First Pursuit Group, First Army on April 30, 1918, and reached the front on June 1st at Toul. This squadron was engaged in the operations in the Toul Sector, at Chateau-Thierry, St. Mihiel, and the Argonne-Meuse first and second offensives. The Twenty-seventh carried out 314 patrols and war missions, engaged in 230 combats, and received official confirmation for 54 victories. In all it suffered 22 casualties, consisting of 8 killed, 4 wounded, 7 prisoners, and 3 missing. It ceased operations December 5, 1918.

TWENTY-EIGHTH — The 28th Aero Squadron insignia is that of a painted American Indian looking to the left. Its headdress includes a single feather.

The Twenty-eighth Aero Squadron was a Pursuit Squadron. It was assigned to the Third Pursuit Group, First Army, on August 22, 1918, having reached the front at Vaucouleurs July 15th. This squadron was engaged in the operations in the Toul Sector, St. Mihiel, and the Argonne-Meuse first and second offensives. It ceased operations April 10, 1919. It had made 128 patrols and bombing raids into Germany, fought 29 combats and received official confirmation for 15 victories. It suffered six casualties, consisting of 1 killed, 1 wounded, 2 prisoners and 2 missing.

FORTY-FIRST—The Forty-first Aero Squadron is represented by an oval inclosing a scene in an African desert, a camel appearing in the foreground. This is superimposed upon the numeral V, showing that the squadron was one of the fifth Pursuit Group, Second Army, on October 29, 1918. It did not function on the western front before the armistice. It was ordered demobilized on May 11, 1919.

FORTY-NINTH—The Forty-ninth Aero Squadron is depicted by a snarling wolf's head within a circle.

The Forty-ninth Aero Squadron was a Pursuit Squadron. It was assigned to the First Army on August 14, 1918, having reached the front at Toul Airdrome on August 2nd. It was engaged in the operations in the Toul Sector, St. Mihiel, and the Argonne-Meuse first and second offensives. It accomplished 161 patrols and war missions, fought 53 combats and received official confirmation for 24 victories. It ceased operations on December 5, 1918. It suffered 6 casualties, consisting of 3 killed, 1 prisoner and 2 missing.

FIFTIETH—The Fiftieth Aero Squadron insignia is a silhouette cartoon of a Dutch woman similar to the one in "Dutch Cleanser" advertisement.

The Fiftieth Aero Squadron was a Corps Observation Squadron. It was assigned to the Fifth Corps Observation Group, First Army on August 14, 1918, and reached the

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front at Bicqueley near Toul on September 8th. It engaged in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. It ceased April 1, 1919. This squadron made many reconnaissances over the lines, taking many pictures and gathering much useful information during the accomplishment of which it fought off many German attacks and was credited with one victory. It suffered nine casualties, consisting of 5 killed, 2 wounded and 2 prisoners.

EIGHTY-FIFTH—Winged Cupid with a campaign hat sitting on the top of the world is the insignia selected to represent the 85th Squadron.

The Eightyfifth Aero Squadron was an Army Observation Squadron. It reached the front at the Toul Airdrome on October 24, 1918, and the next day was assigned to the Fourth Corps Observation Group, First Army. This squadron took part in the second Argonne-Meuse offensive. It accomplished several missions over the lines in the few remaining days before the armistice, but was not accredited with any victories nor did it suffer any casualties. It was finally ordered to be demobilized May 11, 1919.

EIGHTY-EIGHTH—The 88th Aero Squadron insignia is a bucking broncho, ridden by a cow boy, all within a circle.

The Eighty-eighth Aero Squadron was a Corps Observation Squadron. It was assigned to the First Corps on May 29, 1918, and on June 1 reached the front at Toul. It was engaged in the operations at Toul Sector, at Chateau-Thierry, St. Mihiel, and the Argonne-Meuse first and second offensives. This squadron accomplished many reconnaissances over the lines, taking many pictures, locating machine gun nests and batteries and gathered military information of greatest value. It received official credit for four enemy planes brought down. The squadron suffered fourteen casualties, consisting of 6 killed and 8 wounded.

NINETIETH—Insignia: Pair of bones: the lucky number, seven, is uppermost.

The Ninetieth Aero Squadron was a Corps Observation Squadron. It was assigned to the Third Corps Observation Group on June 11, 1918, and two days later reached the front at Ourches. It took part in the operations in the Toul Sector, St. Mihiel and the Argonne-Meuse first and second offensives. This squadron carried out many reconnaissances, fought 23 combats and received official confirmation for 7 victories. It suffered 3 casualties, consisting of 2 killed and one wounded. It was ordered demobolized on December 19, 1918.

NINETY-FIRST—The 91st Aero Squadron shows a mounted knight in pursuit of the winged devil whose blood he has already known by the lance.

The Ninety-first Aero Squadron was an Army Observation Squadron. It was assigned to the First Army Corps on May 7, 1918, and May 24th reached the front at Gondreville. It was engaged in the operations in the Toul Sector, at St. Mihiel and the Argonne-Meuse first and second offensives. The Ninety-first accomplished many war missions, fought 104 combats and received credit for bringing down 21 German machines. It suffered 28 casualties, consisting of 10 killed, 8 wounded, 9 prisoners and 1 missing. The Ninety-first was ordered demobilized April 7, 1919.

NINETY-THIRD—The Ninety-third Aero Squadron is represented by an Indian head similar to that of the 28th, but in the reverse direction and bearing two feathers instead of one.

The Ninety-third was a Pursuit Squadron. It was assigned to the Third Pursuit Group, First Pursuit Wing, First Army, and reached the front at Vancouleurs about July 28, 1918. It was engaged in the operations in the Toul Sector, at St. Mihiel, and the Argonne-Meuse first and second offensives. It took part in 157 war missions, fought 64 combats and received official confirmation for 32 enemy planes brought down. The Ninety-third suffered 8 casualties, consisting of 2 killed, 1 wounded, and 5 prisoners. This squadron ceased to function December 11, 1918.

NINETY-FOURTH—The 94th Aero Squadron insignia is the well-known "hat in the ring".

The Ninety-fourth Aero Squadron was a Pursuit Squadron. It was assigned to the First Army Corps on April 9, 1918, having reached the front at Epiez on April 1st. This squadron was engaged in the operations in the Toul Sector, at Chateau-Thierry St. Mihiel, and the Argonne-Meuse first and second offensives. The squadron accomplished 304 patrols and war missions, fought 114 combats and brought down 64 enemy planes which were officially confirmed. It ceased operations on April 7, 1919. It had suffered 18 casualties, consisting of 10 killed, 4 wounded and 4 taken prisoners.

NINETY-FIFTH—The 95th shows the familiar kicking mule, poised on its front feet, ready to deliver a blow.

The Ninety-fifth Aero Squadron was a Pursuit Squadron. It was assigned to the First Army Corps on May 29, 1918, having reached the front at Amanty on May 18th. This squadron was engaged in operations in the Toul Sector, at Chateau-Thierry, St. Mihiel, and the Argonne-Meuse, fought 230 combats, and was officially accredited with having brought down 47 enemy airplanes. It suffered 21 casualties, consisting of 6 killed, 4 wounded, 10 taken prisoners and 1 missing. It was ordered demobilized December 5, 1916.

NINETY-SIXTH—The 96th, a bombardment squadron, is represented by the head and shoulders of a red devil, who prepares to launch an aerial bomb. This figure is placed on a white triangular shaped background.

The Ninety-Sixth Aero Squadron was a Day Bombardment Squadron. It was assigned to the First Day Bombardment Group, First Army, on May 29, 1918, having reached the front at Amanty on May 18th. It was engaged in the operations in the Toul Sector, at St. Mihiel, and the Argonne-Meuse first and second offensives. This squadron made many bombing raids into Germany destroying a great amount of enemy property and gathering much valuable information. It fought 19 combats, and was officially accredited with 14 enemy airplanes. The squadron suffered 41 casualties, consisting of 12 killed, 12 wounded, 15 taken prisoners and 2 missing. It ceased operations December 11, 1918.

NINETY-NINTH—A conventional American bison in silhouette is the insignia of the 99th Aero Squadron.

The Ninety-ninth Aero Squadron was a Corps Observation Squadron. It was assigned to the Fifth Corps Observation Group, June 12, 1918, having reached the front on May 31st at Amanty. This squadron was engaged in the operations in the Toul Sector, at St. Mihiel and the Argonne-Meuse first and second offensives. The squadron performed many reconnaissances and war missions into German territory, fought eighteen combats and received official confirmation for three victories. It suffered 13 casualties, consisting of 6 killed, and 7 wounded. It ceased operations February 13, 1919.

ONE HUNDREDTH—The 100th Squadron shows the devil riding on an aerial bomb in flight.

The One Hundredth Aero Squadron was a Day Bombardment Squadron. Is was assigned to the Second Day Bombardment Group, Second Army on October 26, 1918, having been on the front since July 20, 1918, with the Royal Air Force. It was engaged in British operations. This squadron accomplished many raids into Germany without suffering any losses. It is not given official credit for any enemy planes brought down. It ceased operations on April 3, 1919.

ONE HUNDRED AND THIRD—The 103rd Squadron was represented by another Indian head with a large war bonnet decortaed with a swasticka.

The One Hundred Third Squadron was a Pursuit Squadron. It was assigned to the Second Pursuit Group, First Army, June 30, 1918. From February 18, 1918, until July 4, 1918, this squadron had served with the French army as the Lafayette Escadrille. After joining the American Army it was engaged in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. This squadron carried out many war missions, fought 327 combats and was officially accredited with 51 victories. It suffered 15 casualties, consisting of 6 killed, 3 wounded, 4 taken prisoners and 2 missing in action. It ceased operations December 11, 1918.

ONE HUNDRED AND FOURTH—Insignia: Figure of winged sphinx, placed in a large circle.

The One Hundred and Fourth Aero Squadron was a Corps Observation Squadron. It was assigned to the Fifth Corps Observation Group, First Army , August 7, 1918, and reached the front at Souilly on September 8, 1918. It was engaged in the operations at St. Mihiel and the Argonne-Meuse first and second offensives. This squadron made many reconnaissances over the lines, fought 25 combats, was officially accredited with one victory and suffered four casualties, consisting of 2 killed, 1 wounded and 1 taken prisoner. The squadron ceased operations December 19, 1918.

ONE HUNDRED AND THIRTY-FIFTH—The 135th represents the Statue of Liberty with the rising sun as a background.

The One Hundred Thirty-fifth Aero Squadron was a Corps Observation Squadron. It was assigned to the Fourth Corps Observation Group, July 28, 1918, and reached the front at Ourches two days later. The squadron was engaged in the operations at Toul Sector, at St. Mihiel and the Argonne-Meuse first and second offensives. This organization made many reconnaissances into German territory, gaining valuable information, fought many combats and was officially accredited with having brought down 8 enemy aircraft. It ceased operations February 5, 1919. The squadron suffered 7 casualties, consisting of 5 killed and 2 wounded.

ONE HUNDRED THIRTY-EIGHTH—A charging goat under full speed about to pass through the numeral V is the insignia of the 138th Squadron.

The One Hundred Thirty-eighth Aero Squadron was a Pursuit Squadron. It was assigned to the Fifth Pursuit Group, 2nd Army, on October 28, 1918, but due to the signing of the Armistice a few days later, it did not function on the front.

ONE HUNDRED THIRTY-NINTH—The 139th was represented by an outline figure of flying Mercury.

The One Hundred Thirty-ninth Aero Squadron was a Pursuit Squadron. It was

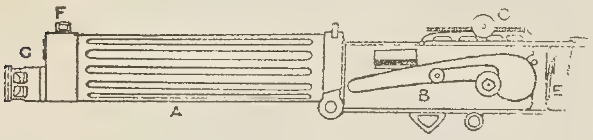
(Continued on page 11)

Notes on Technical Aeronautics

AIRPLANE ARMAMENT

The armament of most airplanes consists of machine-guns of which the types in common use are the Lewis, the Vicars, Browning and the Marlin. The Lewis is a light air-cooled gun which has amunition fed from disc-shaped trays or drums revolving above the mechanism casing, and which is extremely well suited to use on aircraft.

The Vickers gun is practically a light air-cooled Maxim. The cartridges are fed through the mechanism on a belt of webbing. This gun is not so well suited to use on movable mounts as is the Lewis and, in consequence it is usually fixed rigidly to the machine and synchronized so as to fire through the propeller without damage to the blades.



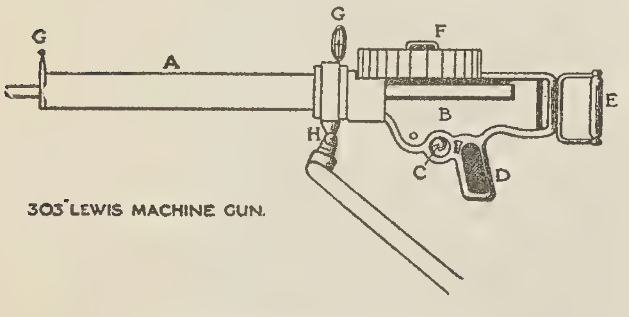
VICKERS MACHINE GUN

The position of the guns varies according to the type of machine. Single-seater fighting scouts usually have one or two synchronized Marlin, Browning or Vickers guns fixed on the engine cowl and semi-enclosed. In addition to the fixed guns there are often one or two Lewis guns pivoted on the top plane so that they may be fired downward or vertically as required. The triggers of machine-guns on single-seaters are usually connected to triggers on the control levers.

Two seaters usually have one or two synchronized Vickers guns arranged as on the single-seaters and fired by triggers on the pilot's control lever, and also a Lewis gun on a movable mount or gun ring placed round the observer's compartment.

Occasionally two Lewis guns are fixed on one gun-ring; they are both rigidly fixed together and handled as one gun. The pilot grips the spade grip of one gun with the right, and the pistol butt of the other with his left hand, The triggers are inter-connected so that both weapons fire at once.

Verv few machines carry guns of larger bore than .303, but the Davis "non-recoil" gun is gradually coming into use. This ingenious weapon makes it possible for an airplane to fire a fairly large shell without straining the structure; the recoil is counteracted by an equal and opposite recoil.



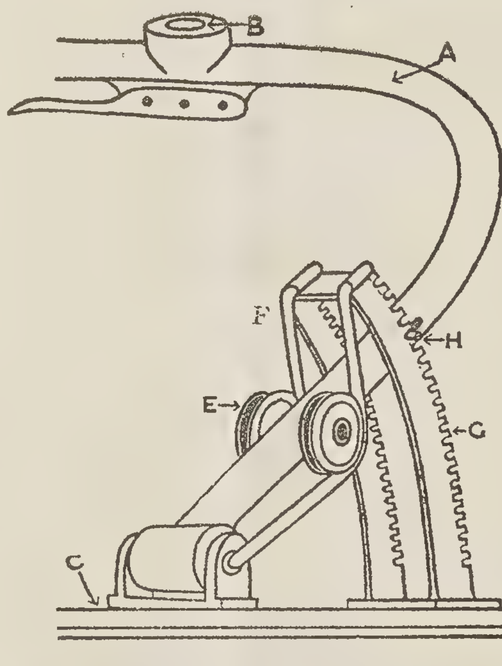
LEWIS MACHINE GUN

The gun ring is a movable gun mounting which is used to a very large extent on two-seater machines. The essential parts of the mounting, shown in the center illustration are A, U-shaped arm working on the turntable C. The arm is hinged, and moves up and down in the rack G. The teeth of the rack are engaged by the pin H which is moved clear when the central handle is gripped. The movement of the handle also releases the locking mechanism of the turntable. Thus, when the gunner wishes to raise or turn his mounting, he simply grips the handle and moves the whole fittings into the required position; when the handle is released all movement is stopped.

The weight of the gun is taken off the gunner's hands during movement by the rubber cords, F, which pass under the pulleys attached to the arm. The gun is pivoted on the boss, B, in the middle of the arm.

CHANGES IN THE DH-4

American DH-4 airplanes are now being remodeled and changed in certain ways. The remodeled plane will be called DH-4B (Bluebird). The remodeling will be done by various plane manufacturers and built to conform to specifications given out by the Air Service, Engineering Department.

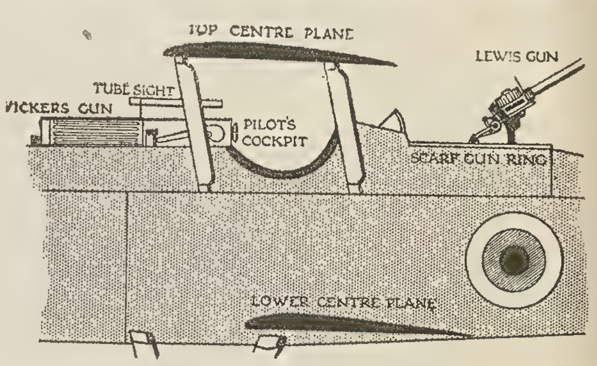


DETAILS OF THE MOUNTING FOR THE LEWIS MACHINE GUN

After the modifications are completed the planes will be completely assembled by the contractors and engines installed, the engine and its accessories and controls placed in proper working order and the wing sections assembled in order to verify attachment and proper adjustment. The airplanes shall be delivered to the Government F.O.B. cars at the contractor's factory and shipped with the fuselage mounted on the landing gear and wing sections assembled with the exception that the interplane struts will be removed.

While at the contractor's plant the new DH4-B planes will be renumbered to conform to a new series. One of the first ten remodeled airplanes of each manufacturer will be completely assembled by the contractor and tested by the Government to determine that the new installations, etc., are correct.

The changes which the remodeling of the DH-4's into the DH-4B's will effect are such that the remodeled machine will resemble in a great many respects the DH-9. Gasoline tanks will be moved forward and located approximately at the present pilot's position and pilot's seat moved back so that he sits close to or directly in front of the observer, occupying the space now occupied by the gasoline tank. The controls will be considerably remodeled and improved including a new stick in the observer's cockpit. There will also be erected a new fire wall between the engine and gasoline tank. The instrument board in the pilot's cockpit will be relocated as well as some of the engine accessories and other equipment, i. e. storage battery, oxygen apparatus, radio equipment, etc. These alterations will necessitate certain additions and rearrangements of truss wires and reinforcements at various points in the fuselage.



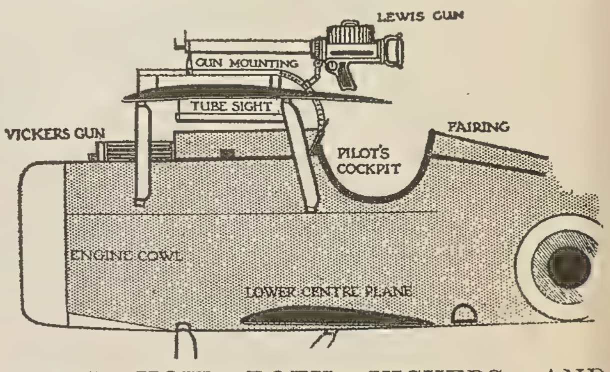
SHOWS HOW GUNS ARE ARRANGED IN A TWO SEATER

Due to the change of position of the pilot the fixed Marlin guns will be moved back considerable distance in order that he may operate them from his new position. The cowling over the gasoline tank and around the pilot's and observer's seats will be changed to conform to the new seating arrangement. Other than the changes noted and those structural changes necessary to support the same DH-4B's will not differ from the DH4's.

Chicago's Big "Zoom"

Middle Western states will unite in the greatest progressive "zoom" in aviation when governors and their representatives from twenty-two states meet in Chicago January 12-13 to organize the Mississippi Valley Aviation Clubs Association.

The mayors of more than 200 cities also have responded to the invitation, promising to co-operate in every way to further the association's aims.



SHOWS HOW BOTH VICKERS AND LEWIS GUNS ARE MOUNTED ON A SINGLE SEATER

The occasion is to be the first Aeronautical Show ever held in the west. This display of 1920 designs in aircraft opens at the Coliseum January 8 and continues until January 15. New models will be shown by every manufacturer and the entire progress of the science of flying will be related by the various exhibitions.

Army and Navy Cooperation in the Air

A Naval Officer Expresses His Opinion of the Present Complicated Aeronautical Situation

There has been a great amount of discussion recently in connection with the united air service as to the lack of coopeeration between the army and navy. That this exists everyone admits but the navy's point of view is given in the following summary by an naval officer who apparently has the facts well in mind:

The Statement

The agitation for a separate Department of Aeronautics is based on two false inferences, to wit:— —

(a) Cooperation has never been provided for.

(b) Friction and duplication are general.

Consider the latter statement first. The facts are that during the war and for several months after the armistice the policies of the army and navy in all matters regarding aircraft were well defined and all important undertakings of either service were authorized only after consultation with the other service directly or through certain boards existing for the purpose. While the spirit of cooperation was alive, there was no need for any special machinery to avoid duplication, waste, friction, etc. The technical people in the army and navy have, however, maintained to this day the closest contact and the most cordial relations both of a personal and a professional nature.

In the last few months, simultaneously with agitation for an independent Department of Aeronautics (by officers of the Army Air Service), there has suddenly appeared among one or two divisions of the Army Air Service an entirely different spirit. A few flagrant cases of duplication, involving a repudiation of agreements previously made between the army and navy to insure coordinated efforts, have been made much of in advocacy of a Department of Aeronautics by the very officers responsible for their existence.

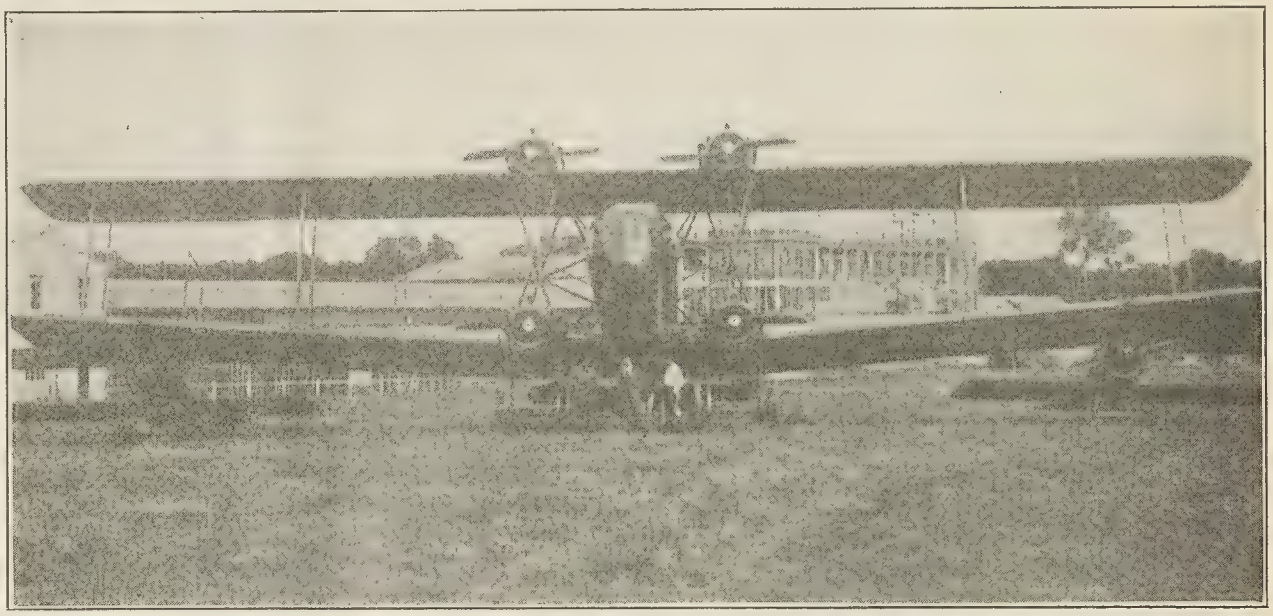
In general, the army and navy work in the closest harmony especially the technical services. Such cases of lack of harmony as can be found are confined entirely to the post armistice period after agitation of the Department of Aeronautics had started, and a few cases abroad during the war which may be attributed to incomplete organization in our early stages, but not at all to the fundamental organization of the army or navy, or the desire of the responsible officers to supplement and coordinate each other's efforts.

Specific Incidents

Specifically, the cases other than trivial incidents which are pointed out as sore spots are:—

A. The purchase of Caproni bombing planes in Italy by both the army and navy. Each service had need for the same type of plane. The army started negotiations but was unable to arrive at an agreement with the Italians with respect to the supply of raw material. The navy was in a position to supply the raw material needed by the Italians and undertook to do so, in return for the Caproni planes. An agreement was made between the army and navy for the army to supervise the production for both, the navy supplying the raw material as agreed. The planes so obtained were to be divided between the army and navy in a proportion agreed upon. The results were disappointing not through any defect in cooperation, but to two fundamentals:—first, the inability of the Italians to do what they promised, and second, the inability of the army officers in charge of the joint production to force the Italians to delivery either satisfactory planes or planes in satisfactory quantity. The whole purchase was a disappointment, but this case has been used as evidence of need for a Department of Aeronautics.

B. The organization by the navy in France of an expedition of land bombing planes to attack the German submarine bases on the Belgian coast. This expedition accomplished nothing because the Germans evacuated those bases before the bombing operations were carried out. It has been urged in support of a Department of Aeronautics that this naval effort was a diversion to a useless purpose of planes and engines which could have been used to greater advantage by the army. The entire scheme was approved by the army in France and organized with the advice and assistance of the army. That no results were obtained has nothing to do with any defect of cooperation between the two services.



NEW BLIEROT AERO BUS WHICH CARRIES 28 PASSENGERS AND IS DRIVEN BY FOUR 250 H. P. ENGINES

Duplication

C. The submission to Congress for the 1919 estimates of almost identical propositions by the army and by the navy for rigid airship stations in New Jersey. This is a clear case of duplication. The army air service was informed of the navy's intention to ask the Congress for a rigid airship station on the East coast and inquiry was made as to the availability of Camp Kendrick which was reported as to be sold. Officers of the Army Air Service then investigated Camp Kendrick for the navy and also Camp Dix, and persuaded Mr. Baker to include estimates for the army for a similar project to go up at Camp Dix. They also persuaded Mr. Baker to write a letter to Mr. Daniels requesting cancellation of the agreement of 1918 by which the army and navy development of rigid airships (Zeppelin type) should be carried on by the navy for the first ships. Mr. Daniels declined to agree to cancellation of the agreement and the resulting duplication of investment. The army estimates, however, were not changed.

D. The same question has now arisen in connection with the 1920 estimates. To avoid such duplication of items of estimates submitted to Congress, Mr. Baker and Mr. Daniels have ordered the army estimates and the navy estimates for 1920 to be reviewed by the Joint Army and Navy Board of Aeronautics. This board has found that the army has again included several millions for a rigid airship station, this time on the Pacific Coast rather than New Jersey. The fact that the board finds such duplication has been reported to the War and Navy Departments for decision as to policy. This incident is also being used in pressing the urgent need for a Department of Aeronautics by the officers of the Army Air Service responsible for including the item a second time in repudiation of the agreement still in force that the navy is charged with rigid airship development work for both services.

These items are the sole matters of other than trivial importance which show apparent lack of cooperation. On the other hand, the vast volume of business during the war and since conducted jointly or in cooperation by the two services has gone ahead so smoothly and quietly that attention is not drawn to it.

Illustrations

The following instances in particular illustrate the policy:—

During the war the army purchased all Pacific Coast spruce, cotton fabric, acetate dope and solvents, steel tubing, and other special materials for both the army and the navy.

Similarly, the army produced engines for both services.

The army produced Standard, Thomas-Morse and DH-4 planes for both services.

The navy supplied New England spruce for both services.

The army and navy specifications for materials were prepared in consultation and made uniform in their requirements.

The army and navy contracts for planes were coordinated by the Aircraft Board.

The army and navy jointly arranged to take care of necessary plant expansions for aircraft building at Akron and Buffalo.

(Continued on page 10)

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Formerly Air Service Journal

Foreign Expositions

THE New York Sun in an editorial headed "America Humiliated at the Airship Show" brings forcibly to the attention of the public the pathetic fact that the United States is not represented at the Paris aircraft salon. It states: "President Poincaire opened the Paris aircraft show Friday, thus giving sanction to the greatest exhibition of aircraft ever assembled. It is the sixth Exposition of Aerial Locomotion, the first held since 1913. In the intervening years aircraft builders have been too busy to exhibit their products. It includes "marvels which almost exceed the flights of fancy." And it discloses one thing which must humiliate every American: there is not a single American offering in the show.

"America gave the airplane to the world. America produced the first birdmen. In the conquering of the air America led the scientists and those who put their scientific discoveries into form for practical application. Between April, 1917, and November, 1918, America poured money into airplane research, experiments and construction at a rate never before equalled. America took an industry it had neglected and tried in a few months to force it to maturity. In a measure it succeded. But when the emergency passed enthusiasm abated, and again this modern, essential industry was left without adequate official support.

"We have said this is humilitating. It is worse than humiliating. The weakness of which our non-representation at the air plane exposition is symptomatic is dangerous. If it continues America will be forced to pay a high price for our refusal to support the great and revolutionary art of transportation through the air."

The constructors of airplanes in this country will be glad to have the public informed of this condition. They have had to wait patiently and see their business go to practically nothing owing to the refusal of Congress to entrust sufficient funds for a new building program to the present authorities. It is to be hoped that 1920 will find this condition altered so that at the next exposition America may show its latest aeronautical products.

The Future Navy

"SOME officers say that the battleship is more alive than ever; others declare that the battleship is dead. I considered that the battleship was dead before the Great War and I think her more dead now, if that is possible. The battleship of today costs roughly 8,000,000 pounds; she carries about 1,000 shells, containing about 100,000 lb. of high explosive; her effective range is, say, fifteen miles; she is vulnerable to aircraft with bombs and aerial torpedoes and to submarines, the latter carrying possibly a 15-inch or 18-inch gun, and the ordinary automobile torpedo is still in process of development, and may in the future carry a ton of high explosive, which would probably sink any battleship.

"For 8,000,000 pounds we could build many airplane-carrying ships, equipped with airplanes carrying over 100,000 lb. of high explosive. If these airplanes carried fuel sufficient for five hours, their range would be about 150 miles out and 150 miles home.

"In the battleship we put all our eggs into one basket. In peace time the airplane-carrying ships could be used as passenger ships, and the airplanes for carrying passengers instead of bombs.

"Then there is the relative cost of upkeep to be considered. The single battleship would require in peace time about 120,000 pounds a year. The airplane-carrying ships and the airplanes would cost nothing; they would be earning money. The officers and men to form the crews of the ships would belong to the Merchant Navy. Airplane pilots will be as numerous as taxi-drivers and get about the same pay. The battleship waddles along at twenty miles an hour, and cannot waddle very far, and in comparison with an airplane has very low rate of speed.

"It takes a battleship weighing 30,000 tons to carry 100,000 lb. of this explosive. Ten airplanes weighing about three tons each would carry the same amount, so the relative weights of the carriers is as 30 tons to 30,000 tons.

"When the battleship nears the end of her coal or ammunition, she must waddle home at about the same speed as a South-Eastern Railway train(I am told that this is the slowest line on earth), and it takes her several hours to fill up, even if she uses oil fuel. The airplane does not waddle home, but comes back at 100 miles an hour, and it takes three minutes to fill her up with fuel and ammunition.

"The battleship is dead. The future is with the airplane which is going to develop rapidly in the next few years."—From Admiral Sir Percy Scott's "Fifty Years in the Royal Navy."

The Partially Disabled Airplane

WE wonder whether sufficient attention has been given to the problem of the partially disabled airplane. Any plane should be capable of reaching the ground safely even after certain parts have failed in the air. It is, of course, impossible to secure complete duplication of all parts without a prohibitive increase in weight, but a great deal can be done nevertheless.

In the flying truss for instance, besides duplication of lift wires, both front and rear, it is quite possible to compute the possible stresses when a flying wire has gone, by the application of the principle of least work, and to design the structure so that it still offers a sufficient factor of safety. Incidence or cross bracing wires, which are generally fixed by purely empirical methods, might be heavied up and made to take care of unbalanced loads by transferring to the undisabled truss.

In some cases the calculations of the partially disabled truss may be extremely laborious. In the case of the triplane they become very difficult owing to the redundancy of the structure. But in no case are they impossible, or is the result to be attained not important enough to warrant a great deal of effort.

Twin Engine Mountings

One of the most difficult things in twin engine airplane design is the mounting of the engines. If the engines are mounted in a V there is a complete truss, but the strength of the V struts themselves with the weigh of the engine applied somewhere at their midpoints becomes a matter of some uncertainty. If the engine is placed between two sets of vertical struts, there is considerable uncertainty as to the completeness of the truss, and to the degree in which cross wiring is effective when carried through the engine. It behooves a designer to be extremely careful in seeing that he has a correct and trustworthy truss under such circumstances.

Carried 30,000 Letters

All load-carrying airplane records were broken on Dec. 2, 1919, when a twin motor De Haviland 4 plane devised and manufactured for the Post Office Department, covered the distance between the air mail field at Washington and that at Belmont Park, New York,—a distance of 218 miles in 1 hour, 34 minutes, with a mail load of nearly 30,000 letters weighing 630 pounds. The speed was at the rate of 138 miles an hour. The best previous record was on September 19, when a single motor De Haviland carried 300 pounds of mail from Washington to New York at a speed of 123 miles per hour and the third best record was on October 1 when a Curtiss plane carried 348 pounds from New York to Washington at a speed of 118 miles per hour.

The twin-motor De Haviland was piloted by Samuel C. Eaton, Jr., of Philadelphia, Pa., and left College Park at 11 a. m., arriving at Belmont Park at 12:34 p. m. The time of flight included two circles around the field for altitnde before setting out on his course and was the first trip made by the plane in a regular carrying of the mail. This plane is perhaps the only twin-motored plane built in the United States which not only maintains the altitude under full load with one engine but actually climbs on one engine. In the opinion of the postal authorities it is the greatest forward step in the development of a small weight-carrying plane. It eliminates the fire hazard by having the engines in the wings and away from the gasoline supplies and also it minimizes danger to the pilot for the same reason. The twin motor De Haviland is a distintive product of the postal service being outlined personally by the Second Assistant Postmaster General Otto Praeger. The details of construction were worked out by A. H. Flint, College Point, N. Y.

The plane will enable the department to salvage several hundred thousands of dollars worth of De Haviland 4 war planes and parts as well as Liberty motors, the power plant being two six-cylinder Libertys of 200 h.p. each which can be constructed almost entirely out of one 12-cylinder, 400 h.p. Liberty. The plane can carry nearly double the mail load that is carried by the single motor De Haviland.

New Air Mail Field

Recently a Martin twin-motored mail plane piloted by Stevens and carrying 1066 pounds of mail left College Park mail field at Washington at 11:30 a. m. in a heavy snow storm and made the flight to Hellers Field, Newark, N. J., in 2 hours. Hereafter all mail planes will leave and arrive on this field instead of the Belmont Park field on Long Island. The change in fields will give quicker exchange of mail between the air mail field and the New York post office.

England Wants Libertys

According to a report received from England a number of commercial Aircraft Companies in England are very desirous of obtaining Liberty motors in a moderate quantity for utilization in their commercial types of airplanes. It is apparently impossible at the present time for such companies to obtain Liberty motors through the British Air Ministry, and it is believed that if arrangements could be made to establish an agency for Liberty Motors in England there would be a considerable demand for them.

For the same class of work for which the Rolls-Royce Eagle VIII, the Napier Lion or other engines of this type are used, the Liberty motor is very highly considered.

Among the companies that have specially signified their desirability of obtaining Liberty Motors may be mentioned The British Aerial Transport Co., Ltd. and the Westland Aircraft Engineering Co., Ltd.

Seagull in New Orleans

W. E. Doherty, formerly senior lieutenant in the United States flying corps, who saw several months' service in Italy, is now in New Orleans on a demonstration tour with a Curtiss Seagull three-passenger flying boat. The Seagull was flown from Memphis, Tenn., to New Orleans—a distance of 850 miles—stops being made at Greensville, Vicksburg, Natchez and Baton Rouge.

It is the first time that the Seagull has made its appearance on the Mississippi river, and, according to Doherty, great interest has been aroused by the expedition. Chambers of Commerce are thoroughly interested in aviation and plans are under way for the opening of municipal fields and the organization of aviation companies in many cities.

In Memphis, the Seagull met the NC-4 which is now on a recruiting tour in the Mississippi Valley. Stanley H. Tresevent, U. S. Marshall deputized the Seagull to hunt down illicit liquor transportation. Learning that a shipment was to be made, Marshall Tresevent and Pilot Doherty went on a two-hour flight up the Mississippi river, but their efforts were unsuccessful.

Several demonstration flights were made in Memphis and also enroute to New Orleans. The Seagull will remain in the south for a considerable period making passenger flights, doing demonstration work and promoting general aviation interests.

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STRENGTH REPUTATION SERVICE

Army and Navy Cooperation In the Air

(Continued from page 7)

The production of Helium gas was and is a joint undertaking.

The army and navy negotiated jointly with regard to patent royalties to Wright and Curtiss.

In France there was a free interchange of facilities, materials, parts, motor transport, etc., between the army and navy as emergency required.

In short, lack of cooperation between the army and navy has been, until very recently, practically impossible due to coordinating agreements, etc. So long as such agreements are legally carried out there is no friction. The few cases of divergence which can be found now are of recent origin and due to failure to live up to such agreements.

Eagle Makes Climb Record

In order to demonstrate the adaptability of the Curtiss Eagle, eight-passenger limousine, for work in high altitude localities, Bert Acosta, chief pilot for the company, recently made a test flight at Mineola, climbing 6,500 feet with four passengers and 768 pounds of gasoline. The demonstration was made for a prospective customer who is contemplating the purchase of an Eagle for passenger-carrying work. According to Acosta, the machine is capable of climbing to and operating at an altitude of 10,000 feet.

Several inquiries have been received by the Curtiss Company concerning the Eagle—an engineering concern desiring the use of a machine of the carrying capacity of the Eagle to transport construction materials on a project in the Sierra Nevada Mountains. High powered airplanes, capable of carrying a half-ton load, will facilitate the work, especially in the saving of time, as the location of the work is in a country where mule-driven vehicles only can operate at the present time.

Florida an Aviation Center

Florida promises to be the center of aviation activities during the coming months for, with the opening of the famous winter resorts, many aviators are heading their machines southward. Aviation companies as well as private owners, are focussing their activities upon the Everglade State, and, as a result, aviation should receive a great stimulus in that portion of the United States.

Following a custom inaugurated three years ago, the Curtiss Aeroplane and Motor Corporation has announced the reopening of its flying school at Miami, Florida, after a temporary suspension of activities due to the war and to the leasing of its fields to the U. S. Marine Corps.

E. H. Ballard, former general amnager of this school, will again be in charge of operations, which will include instruction, service, passenger-carrying, aerial photography, demonstration work, and sales promotion, and he will have associated with him staff of Curtiss pilots including Richard H. Depew, Jr., chief instructor in the Curtiss School at Garden City, L. I.; James R. Gray, chief test pilot at the Curtiss Field, Buffalo, N. Y.; William H. McMullen and Paul F. Collins, former lieutenants in the U. S. Air Service.

Operations will be started with seven machines—a Curtiss, six Orioles, an OX-5 Oriole, three JN-4D's and two OX-5 Standards. It is also expected that the Curtiss Eagle, eight-passenger aerial limousine, will be shipped o Florida laer in he season and used on a proposed air line between the East and West Coast.

A completely equipped service station for the accommodation of private owners will be operated by Curtiss trained mechanics, including Alex McKay of the Curtiss Flying Station at Newport News Va., W. L. Trask of the Buffalo plant of the Curtiss Aeroplane and Motor Corporation and Theodore Carlisle and M. S. Matthews of the Garden City plant.

The establishment and maintenance of several new aerial transportation lines is also contemplated.

The Miami Field was opened in 1916 when, at the request of the aviation section, the Curtiss Company established a school and, during the year trained many aviators who afterward gained fame in the air service. It was continued in 1917 as a training school but later it was leased to the U. S. Marines.

AIR SERVICE ARTILLERY RADIO BOARD

For the policy of recommending methods and policy of training officers of Field Artillery and Coast Artillery in the conduct of artillery fire from aircraft by means of radiophone and radio, a board of officers was appointed recently consisting of the following: Col. James Prentice, Air Service; Col. William P. Wilson, Coast Artillery; Lieut. Col. Daniel W. Hand Field Artillery; Lieut. Col. Follett Bradley, Field Artillery; Lieut. Col. Lewis H. Brereton, Air Service; Capt. O. E. Marvel, Air Service.

This Board of Officers since the date of its appointment, has made recommendations at the following camps, etc.: Fort Sill, Okla.; El Paso, Texas; Langley Field, Va.; Fort Storey, Va.; Washington, D. C.

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Deeds and Insignia of Our Aero Squadrons

(Continued from page 5)

assigned to the 1st Army on June 12,, 1918, and reached the front at Toul on June 30 following. The squadron was engaged in operations in the Toul Sector, at St. Mihiel and the Argonne-Meuse, first and second offensives. This squadron accomplished 160 patrols and various other war missions, fought 80 combats and received confirmation for 34 victories. It suffered eight casualties, consisting of three killed, two wounded, one taken prisoner and two missing. It ceased operations December 11, 1918.

ONE HUNDRED FORTY-FIRST—Insignia: Great Bengal tiger playing with a German helmet and iron cross.

The One Hundred Forty First Aero Squadron was a Pursuit Squadron. It was assigned to the Fourth Pursuit Group, 2nd Army, on October 18, 1918, and the next day reached the front at Toul. This Squadron was engaged in the Argonne-Meuse first and second offensives. It accomplished many patrols and war missions into German territory, gaining a great deal of valuable military information. It received official confirmation for bringing down two enemy aircraft. The squadron suffered no casualties before the Armistice and ceased operations May 11, 1919.

ONE HUNDRED FORTY-SEVENTH—A cartoon of a rat terrier is used to represent the 147th Aero Squadron.

The One Hundred Forty-seventh Aero Squadron was a Pursuit Squadron. It was assigned to the First Army on May 29, 1918, and reached the front at Toul on June 1st. The Squadron was engaged in operations in the Toul Sector, at Chateau-Thierry, St Mihiel and the Argonne-Meuse, first and second offensives. This squadron accomplished many patrols and raids over German territory, fought 102 combats and received official confirmation for 31 victories. It suffered 8 casualties, consisting of 7 killed and one missing. Ceased operations on December 5, 1918.

ONE HUNDRED FORTY-EIGHTH—The head of Liberty in a circle was the insignia of the 148th Aero Squadron.

The One Hundred Forty-eighth Squadron was a Pursuit Squadron. It was assigned to the 4th Pursuit Group, 2nd Army, November 4, 1918. This squadron had previously been assigned with the Royal Air Force July 20. 1918, and had taken part in British operations until it had been assigned to the 2nd Army. This squadron had accomplished many patrols over the enemy lines and fought 107 combats and received official confirmation for 71 victories. The squadron suffered 11 casualties, consisting of 3 killed, 3 wounded, 4 taken prisoners and one missing. It ceased operations on December 11, 1918.

ONE HUNDRED FIFTY-FIFTH—The 155th Squadron had for its insignia the head of a large arrow pointed upward.

The Hundred Fifty-fifth Aero Squadron was a bombardment squadron. It was assigned to the First Army on November 9, 1918, but owing to the Armistice being signed two days later, it never functioned on the front. It ceased operations December 4. 1918.

ONE HUNDRED SIXTY-SECOND—The insignia of the 162nd is a silhouette map of the United States.

ONE HUNDRED SIXTY-THIRD—The One Hundred Sixty-third shows the silhouette of a cat with one eye closed standing on a bomb.

The One Hundred Sixty-third Aero Squadron was a Day Bombardment Squadron, and was assigned to the Second Day Bombardment Group, 2nd Army, October 27, 1918, reaching the front 3 days later at Ourches. It engaged in the operation of the Argonne-Meuse, first and second offensives. It acomplished several war missions during this period of activity, but never received official confirmation for any victories, neither did it suffer any casualties. It finally ceased operations April 8, 1919.

ONE HUNDRED SIXTY-FIRST—Insignia: A grinning clown with a cap and ruff.

ONE HUNDRED SIXTY-SIXTH—Insignia: Includes the sun with a pair of wings made of the American flag. In the foreground is a map of Europe, with Germany distinctly marked, while a hand, armed with an aerial bomb, hovers over it ready to drop the bomb.

The One Hundred Sixty-sixth Aero Squadron was a Day Bombardment Squadron. It was assigned to the First DayBombardment Group, 1st Army, September 20, 1918 and reached the front at Maulan about September 25. This squadron engaged in operations in the Argonne-Meuse, 1st and 2nd offensives. It accomplished 11 war missions and bombing raids into German territory, fought off many German attacks and received official confirmation for six victories. It suffered 4 casualties, consisting of one killed and three wounded. It ceased operations April 7, 1919.

ONE HUNDRED SIXTY-EIGHTH—Insignia: A winged skull in a circle.

The One Hundred Sixty-eighth Aero Squadron was a Corps Observation Squadron. It was assigned to the 4th Corps Ob-

(Continued on page 14)

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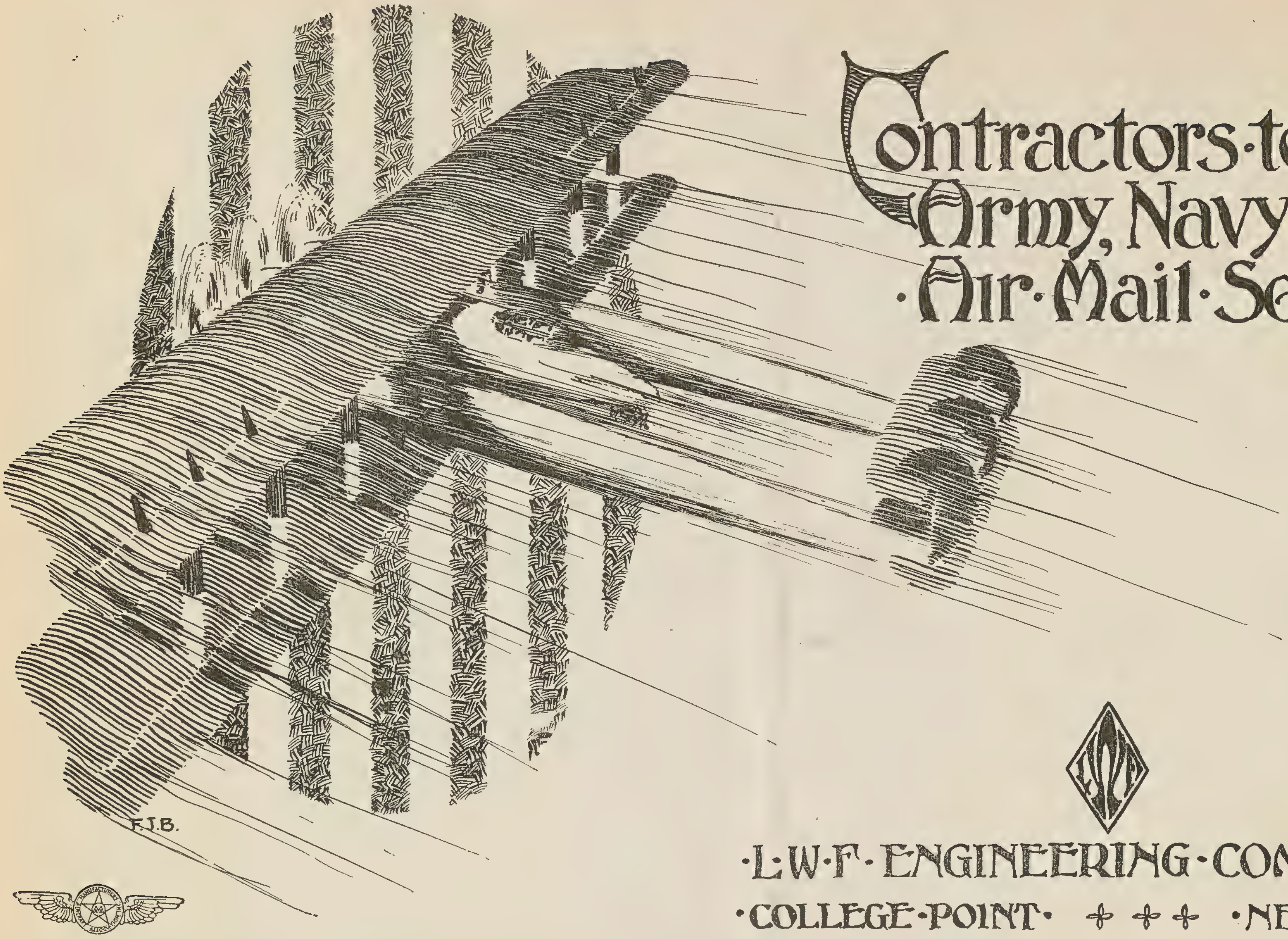

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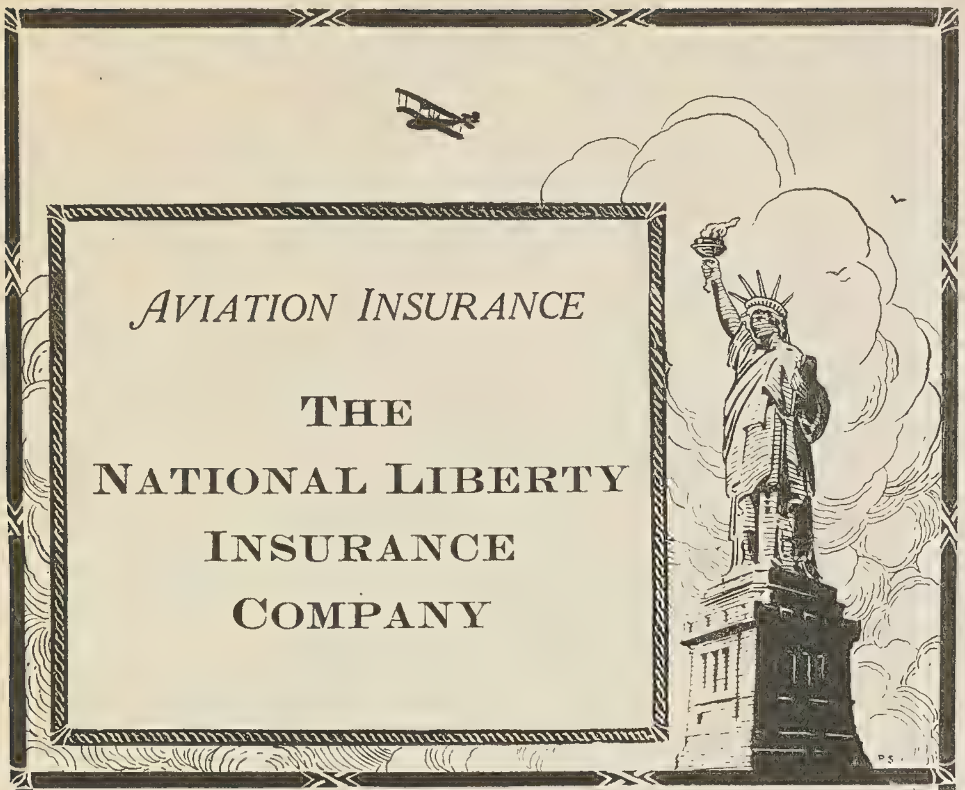

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Deeds and Insignia of Our Aero Squadrons

(Continued from page 11)

servation Group, 1st Army, on September 30, 1918, and reached the front at Toul October 5th following. It was engaged in operations of the Argonne-Meuse, 1st and 2nd offensives. It accomplished many war missions and reconnaissances over the German lines, gaining much valuable military information, fought several combats and received official confirmation for two victories. It suffered no casualties and ceased operations May 11, 1919.

ONE HUNDRED SIXTY-NINTH—Insignia: An unusual hieroglyphic somewhat similar to the monogram CB.

ONE HUNDRED SEVENTY-FOURTH—Insignia: A black alley cat on a fence, silhouetted against the moon.

ONE HUNDRED EIGHTY-FIFTH—Insignia: A silhouette of a bat within a circle

The One Hundred and Eighty-Fifth Aero Squadron was a Night Pursuit Squadron. It was assigned to the First Pursuit Group, First Army, October 5, 1918, and reached the front at Rembercourt, three days later. It participated in the Argonne-Meuse 1st and 2nd offensives. The squadron accomplished several night patrols into Germany, suffered only one casualty, one pilot being taken prisoner, and never received confirmation for any victories. It ceased operations on April 10, 1919.

ONE HUNDRED EIGHTY-SIXTH—Insignia: Not reported.

This Squadron was an Army Observation Squadron. It was assigned to the First Army Observation Group, 1st Army, October 27, 1918, and reached the front at Souilly two days later. It participated in the operation of the Argonne-Meuse two offensives. Up to the signing of the Armistice it had suffered no casualties and had never received confirmation for any victories. On April 10, 1919, it was assigned to the Army of Occupation.

TWO HUNDRED THIRTEENTH—Insignia: The head of an American Indian facing the right with two feathers in his scalp lock.

The 213th Squadron was a Pursuit Squadron. It was assigned to the 1st Army on August 4, 1918, having reached the front at Vancouleurs July 26, preceding. It was engaged in operations in the Toul Sector at St. Mihiel and in the Argonne first and second offensives. This squadron made 148 raids into German territory, fought 38 combats and received official confirmation for 166 victories. It suffered ten casualties, consisting of two killed, three wounded, four taken prisoners and one missing. It ceased operations on April 10, 1919.

TWO HUNDRED FORTY-EIGHTH—Insignia: A black cat wearing a broad grin and decorated with a large bow tie made of an American flag.

The 248th Aero Squadron was a Corps Observation Squadron. It was assigned to the 7th Corps Observation Group, 1st Army on September 10, 1918, and reached the front at Luxeuil on September 19th following. It was engaged in operations in the Vosges Sector.

TWO HUNDRED FIFTY-EIGHTH—Insignia: Reproduction of a lion, apparently carved out of stone.

The 258th Squadron was a Corps Observation Squadron. It was assigned to the 7th Corps Observation Group, September 10, 1918, and reached the front at Luxeuil on September 19th. This squadron was engaged in the operations on the Vosges Sector. It was finally assigned to the Army of Occupation on April 10, 1919.

TWO HUNDRED SEVENTY-EIGHTH—Insignia: Not reported.

The 278th Aero Squadron was an Army Observation Squadron. It was assigned to the 7th Corps Observation Group, 2d Army, October 29, 1918. It reached the front at Toul November 10th; this squadron did not function on the Western front and was finally ordered demobilized May 11, 1919.

THREE HUNDRED FIFTY-FOURTH—Insignia: A witch mounted on a broom stick supplied with model airplane equipment.

The 354th Aero Squadron was a Corps Observation Squadron. It was assigned to the 6th Corps Observation Group, 2d Army, October 21st, 1918, and reached the front at Saiberais four days later. It was engaged in the Argonne-Meuse 1st and 2d offensives. This squadron made several reconnaissances over the German lines and gained a great deal of valuable military information. It neither gained any official victories nor suffered any casualties, and was finally ordered demobilized May 11, 1919.

THREE HUNDRED SEVENTIETH—Insignia: A triangle with a star in the center.

FOUR HUNDRED EIGHTY-SIXTH—Insignia: A large star or comet, with six smaller stars in its wake.

SIX HUNDRED THIRTY-EIGHTH—Insignia: A halfstarved cat super-imposed on the numeral V, signifying the Fifth Pursuit Group.

The Six Hundred Thirty-eight Aero Squadron was a Pursuit Squadron and was assigned to the 5th Pursuit Group, 2nd Army, on October 28, 1918. It did not function on the front before the Armistice and was finally ordered demobilized on May 11, 1919.

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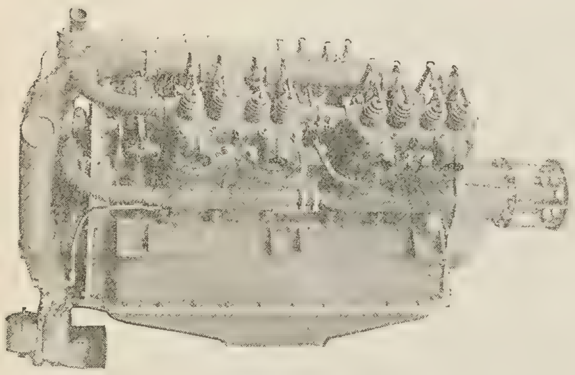

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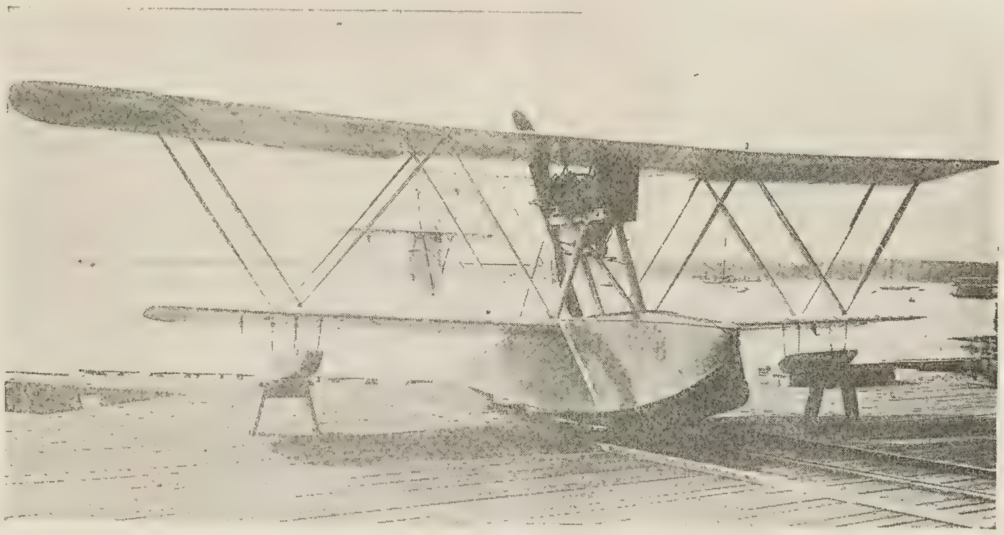

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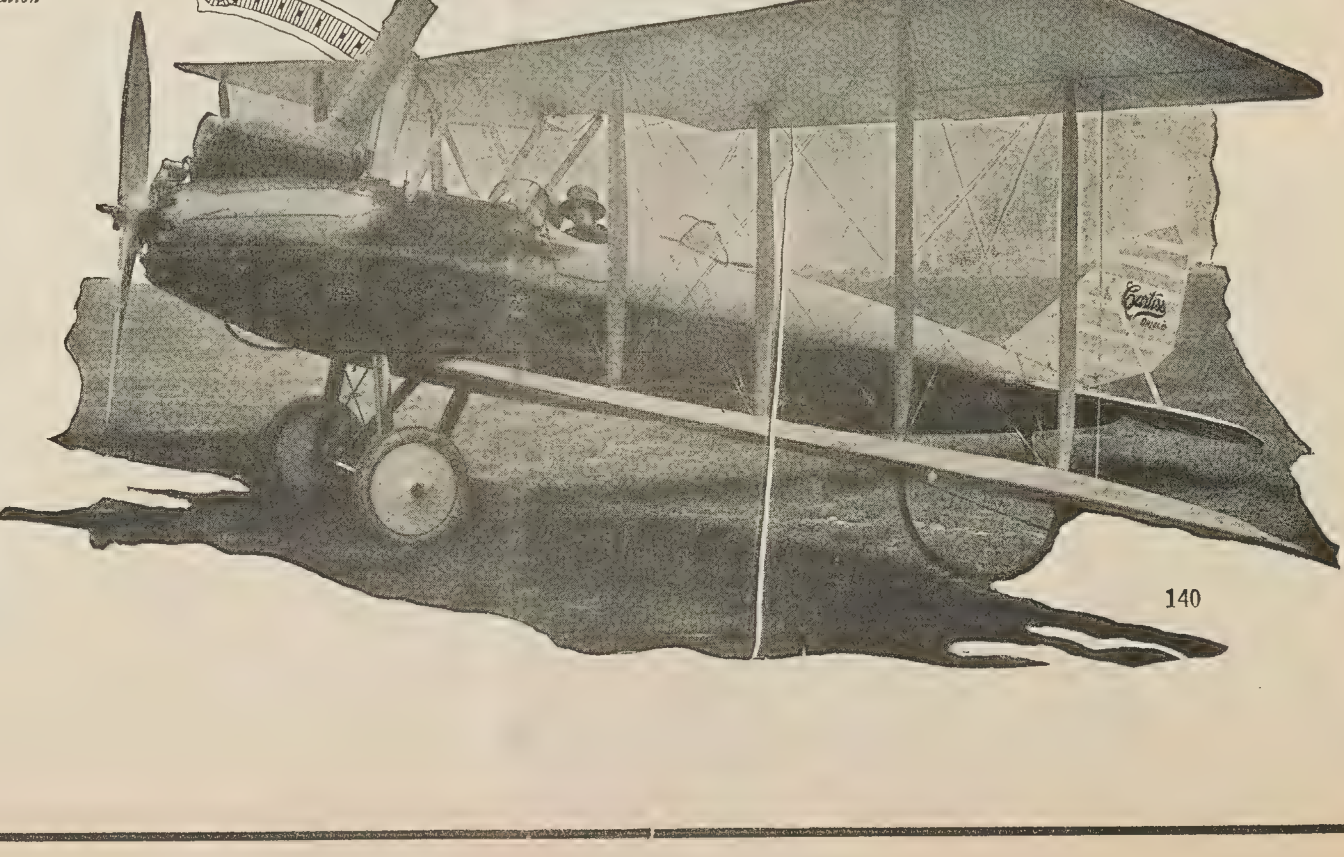

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The Reindeer's Successor

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CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

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FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
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Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

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Crowell on a United Air Service

LaGuardia's Committee Obtains Favorable Views on Aircraft Development in the United States

On Dec. 4, the sub-committee of the House Committee on Military Affairs commenced to hold hearings on the various bills before Congress creating a United Air Service. All the Army officers who have been outspoken in favoring a consolidation of the government aircraft activities expressed their views. Many men prominent in the aircraft industry also gave the committee their opinions. The first person to testify was Assistant Secretary of War Benedict Crowell. His statement is so important that the AIRCRAFT JOURNAL publishes a comprehensive digest of it.

The Sub-committee consisted of F. H. LaGuardia, New York, Acting Chairman; Alvah T. Fuller, Massachusetts; John M. Morin, Pennsylvania; Harry E. Hull, Iowa; Chas. Pope Caldwell, New York; Herbert F. Fisher, Tennessee; Richard Olney, Massachusetts.

Secretary Crowell"s Statement

After outlining the appointment and work of the Crowell Mission which visited Europe to secure the most recent information available on aviation, Secretary Crowell said:

"Up to the time of my leaving for Europe I had no definite views on the future treatment of aviation. I of course knew, through my position in the War Department, the enormous problems we had to face during the war, and that experience forced upon me the feeling that it was of vital importance that something should be done to provide against a repetition of the situation that existed during the emergency.

"After more than seven weeks spent abroad, where I was given every possible facility and opportunity to study what those countries were doing and talk with the men who had control during the war and were shaping the policies for the future, I have become convinced that the only solution of our future air policies is an air department; that only through such a department will it be possible for this country to keep abreast with the other great powers.

"Among the representative men with whom the mission discussed this subject was Winston Churchill, Secretary of State for War and Secretary of State for Air, who said that the British Air Ministry organization, although not perfection, is the best plan yet developed; it is founded on actual war experience. There is no possibility of England reverting to the prewar organization.

"I will read here a short extract from the speech of Lord Fisher, of Great Britain, dated November 16, 1919. He was First Sea Lord of the Admiralty:

"'By land and by sea the approaching aircraft development knocks out the present fleet, makes invasion practicable, cancels our country being an island, transforms the atmosphere into a battle ground of the future. There is only one thing to do to the ostriches who are spending these vast millions on what is as useful for the next war as bows and arrows. Sack the lot. As the locusts swarmed over Egypt, so will aircraft swarm in the heavens, carrying inconceivable cargoes of men and bombs, some fast and some slow. Some will act like battle cruisers and others as destroyers. All cheap and—this is the gist of it—requiring only a few men as crew.'

"'Maj. Gen. Trenchard, R. A. F., chief of staff, Royal Air Force, said:

"'Defense in two dimensions is comparatively simple; but for the defense in the third dimension there is no real effective instrument but an air force capable of immediate contact with the enemy in the air, and able to defeat it—consequently an air force additional to the detachments used for the navy and army should be organized under a ministry independent of the other two services; for if this force is an appendage of either of the older services it will not develop its strategy and tactics along broad enough lines. However, such a force is always available for coordination with naval or military operations.'

"In France, I had the honor of talking with Marshal Foch, who told me that the fact was clearly demonstrated in the present war that, if a nation is to conquer, she must have supremacy in the air.

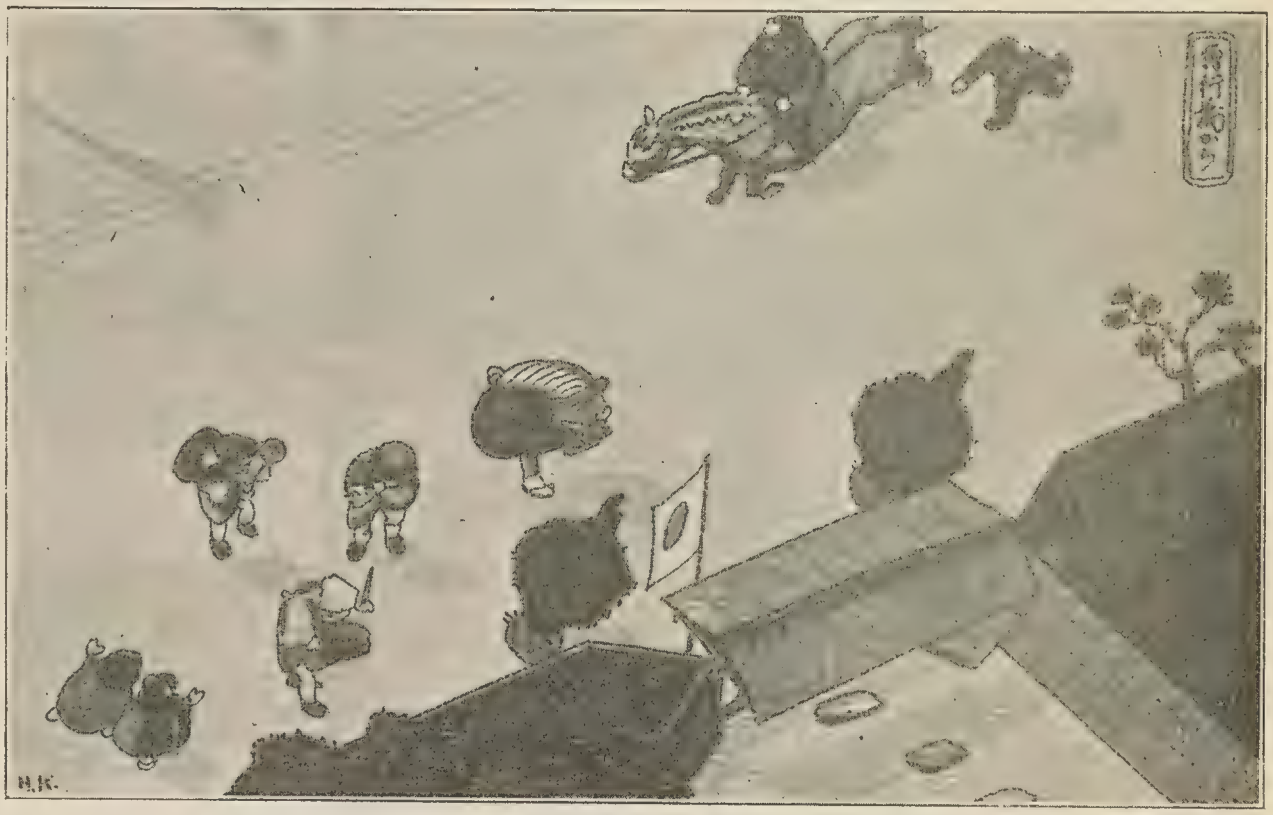
"Gen. Duval, Director of Military Aeronautics, said:

"'If commercial aviation is not encouraged and stimulated, military aviation will die.'

"Since my return from Europe, and during the two months that have elapsed, I have studied most carefully the opinions expressed by a number of gentlemen who appeared before your committee and who have opposed the centralizing of our air activities.

"I have discussed the matter many times with Mr. Baker. I am sorry to say that he does not agree with me. But he has told me that, regardless of our difference in opinion, he is willing to have me present my views.

"The one point which has been impressed upon me by much of the testimony is the lack of viewpoint from the bigger aspects of the matter. They seem to view it merely from its effects on their own particular service and not from the broad viewpoint of the defense of this country and the vital necessity of creating this new weapon of defense to meet the other great powers on an equal footing.



JAPANESE IMPRESSIONIST VIEW OF A TOKIO STREET FROM AN AIRPLANE

"It is not proposed by me to deprive the Army and Navy of any portion of control over the functions of air service deemed necessary to their operations, namely observation, photography, and direction of fire, but in the efforts to retain control over these functions, the most important feature of the future of the Air Service in general is missed. A separate department of aeronautics is a tactical necessity. In future wars it will have a function quite distinct from the conceptions of those who have so far expressed their disapproval of the plan.

Commercial Aviation Needs a Fair Chance

"Marshal Foch, Field Marshal Haig, and Ludendorf agree that before the mobilization of armies can be effected in the next war, a great conflict will occur in the air. The aggressive nation will be prepared to launch an attack upon the shipping, munition, manufacturing, and storage centers and even the cities of its opponent. Unless the opponent is ready to meet or anticipate such an attack, vital victories will be early accomplished. It is only the nation that can clear the air of enemy forces that will be able to launch a campaign with its land and naval forces. With Europe only 16 hours removed from this country by air routes, we can not rest in fancied safety of isolation. It is only through the agency of a single responsible organization that we can confidently look to preparedness for such an eventuality.

"The government can not be asked to sus-

(Continued on page 6)

Notes on Technical Aeronautics

AN INTERESTING TEST FOR FUTURE PILOTS

The British R. A. F. Medical Service has developed a number of interesting tests for future pilots. The first test is the breath-holding test It has been found that the length of time a man can hold his breath is an indication of his fitness for flying at altitudes, the dimunition of oxygen in the lungs as the breath is held being similar to the way in which the oxygen becomes scarcer at altitudes. If the pilot cannot hold his breath for a certain specified time he will be found unsuitable for flying at great altitudes. The time of holding the breath is also tested after a physical exercise, and the decrease in time during which the pilot can hold his breath should not exceed a certain amount. If it does it is a sign of unfitness. A second test consists in measuring the expiratory force by ascertaining how high a column of mercury the pilot can support by blowing. Another test is a mixture of the first two and is carried out by the use of a U tube manometer as shown in the photograph. The capacity of the lungs is also ascertained by making the pilot take as deep a breath as possible and then exhaling into an instrument similar to the ordinary gas meter, which is set at zero before the test. In still another test the pilot has to support a column of 40 mm. of mercury as long as he can, his pulse being measured during the process. To test the reflex reaction time, a pendulum is used which at a given moment shows a small white light. The pilot must press a button the instant he sees the light. This action stops a length of string by which the reaction time can be measured.

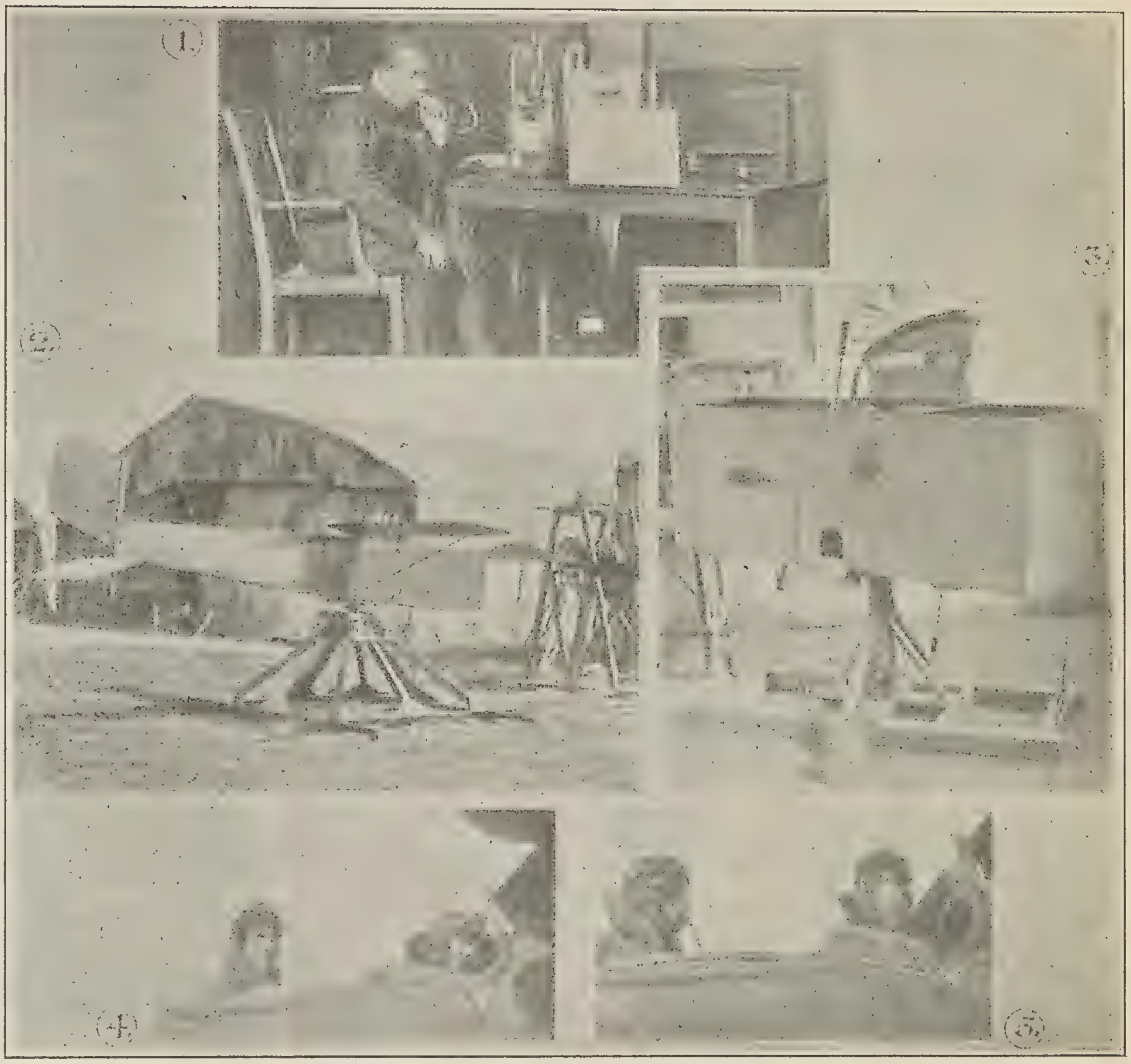
Another interesting piece of apparatus is the airplane fuselage fitted with rudder, elevators and ailerons and pivoted freely, in which the pilot must maintain his balance while the fuselage is placed under the eccentric action of a propeller blast.

THE "AVIETTE"

Gabriel Poulain, a cyclist racer and an aviator, who obtained the first results with a motorless airplane in 1912, lately recommenced his trials with an aviette built by the Nieuport Co., and designed by Mary, the engineer of that firm. During these trials, Poulain has jumped over 12 meters (39.37 ft.) at one metre (3.28 ft.) height.

The machine is a special bicycle fitted with a set of wings designed by Mary, whose aerofoils were tested in Eiffel's wind tunnel. They have a changeable angle of incidence so that, the aviette once under way with pedal power, the wings have the minimum head resistance (angle of incidence:—20 deg.). The speed of the machine being sufficient, the "aviettor," with a special arrangement of the rear wheel, increases the angle of incidence to 6 deg., and the machine gets off and jumps over a distance which depends upon circumstances. The following are the specifications of the machine:—

Span (upper plan)	6.40 meters
Span (lower plan)	4 meters
Total area	14 square meters
Weight of "aviettor"	60 kilos
Weight of machine (without bicycle)	18 kilos
Weight of bicycle	6 kilos
Weight of machine (loaded)	84 kilos



R. A. F. MEDICAL SERVICE EFFICIENCY TESTS FOR PILOTS

1—Shows a candidate undergoing "Fat'gue Test" with the U-tube manometer. 2—Is an illustration of an airplane body, fitted with ailerons, rudder and elevators. This machine is placed in the slip-stream from an airscrew driven by the engine seen in the right hand side of the picture. The candidate to be tested must maintain his balance by operating the controls. The apparatus was designed by Captain de Haviland and built by the Aircraft Mnufacturing Co. 3—Is a nacelle, centrally pictured and operated by the candidate by a stick control. This machine was designed by Major Rippon and Lieutenant Manuel in collaboration with F. Koolhoven, of the British Aerial Transport Co. 4 and 5—Show a pilot and observer going for an altitude flight to test an oxygen apparatus. 5—Shows them with the masks in place, ready for flight.

It is said that MM. Delage (director), Mary (engineer), and Chasserio (foreman) of Nieuports, have made a study of the propeller system for the aviette of the great difficulty. A great advancement has been made in construction, however, 18 kilos for a cellule of 14.70 square meters is a record of lightness. (Aeronautics)

BEAU'S FAST FLIGHT

A new flight record was established December 5, by Lieut. L. V. Beau and his mechanician from Langley Field, Va., to Mineola. Lieut Beau was compelled to stop at Aberdeen, Md. He made the 180-mile trip from there to Mineola in one hour and twenty minutes.

Lieut. Earle H. Mangelman and his observer, Electrician Orville W. Haynes, also arrived at Mineola from Langley Field. They had suffered all the way from intense cold.

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The World's Airplanes and Seaplanes

Recent Types of German Machines

GERMAN AIRCRAFT DEVELOPMENT

These very interesting pictures of German aircraft illustrate the development of aeronautics in that country:

Photograph No. 1 shows a three seater hydroplane built by the Flugzengban Friedrichshafen, at Friedrichshafen. It is equipped with 260 h.p. Mercedes engines, has a weight empty of 4036 kilograms, useful load of 2183 kgs. and gross load of 6213 kgs.

A recent German single-seater built by the Luft Verkehrs Gesellshaft, of clean construction is shown in photograph No. 2.

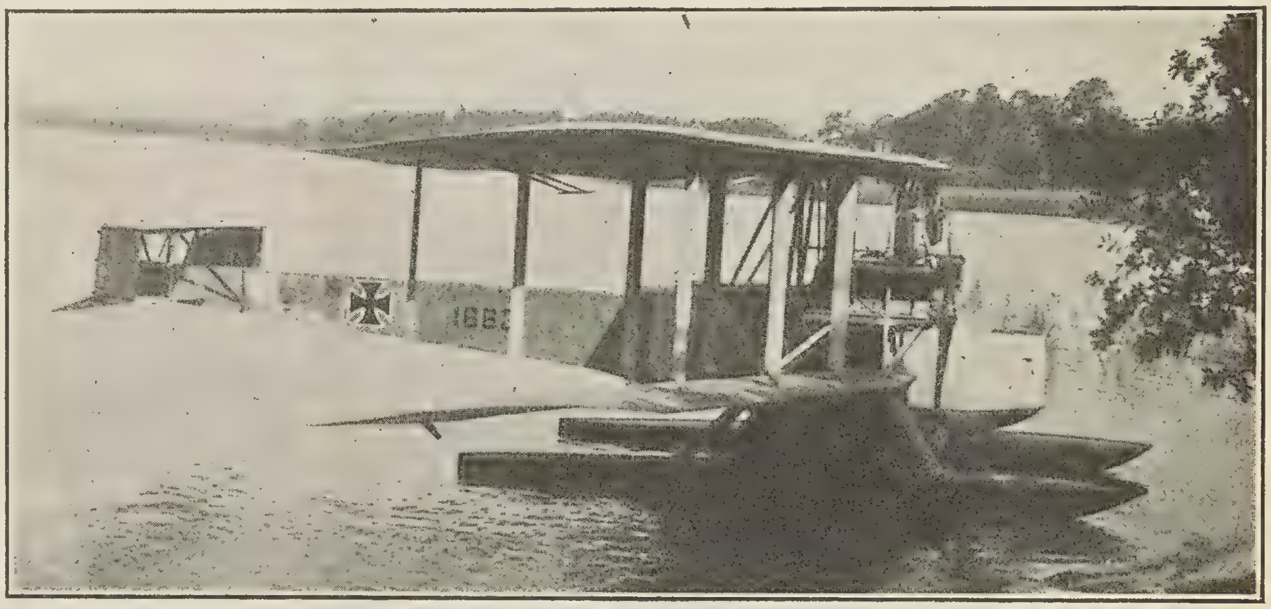
In the photograph (No. 3—See next page) is shown a Roland C III biplane with a 200 h. p. Benz. The body is very deep giving good overhead vision for the pilot. Side windows are provided to give the occupants lateral vision. An anemometer of the vane type is used instead of the Pilot Tube airspeed indicators we are accustomed to. Control surfaces except elevator are balanced.

AVIATION IN ALASKA

Steps are being taken by Training and Operations Group, Air Service, to ascertain the feasibility of an airplane freight to Alaska. Three routes have been outlined and are now being considered. The following valuable data, which might be of interest, has been received from J. W. Tyrrell of Hamilton, Canada, most noted explorer, who has traveled extensively in the subarctics of Canada, and, who probably more than any other person can give valuable advice on the subject.

"It is at least partly due to my supposed intimate knowledge of our North country, that I am an officer in the Guides of the Canadian Militia; and the proposed enterprise would seem to me to be exceedingly venturesome if not a dangerous undertaking, although not perhaps more so than many others which have of recent years been successfully accomplished.

"For many reasons the summer season would of course appear to be the most suitable time for attempting an aerial trip to Alaska or any district in the Arctics; but from my personal knowledge of the North country, which does not extend beyond Dawson City, I believe it would be difficult during the summer season to obtain suitable landing places. The country from Edmonton to the north is mostly covered with timber, although there are some prairie sections along the Peace River and at a few other points, but for the most part, areas which are not covered with timber are composed of fields of broken jagged rocks, upon which it would be impossible for an air machine to land in safety. On the other hand the winter season in the North country is so beset by darkness, and stormy weather, that I would consider a successful air journey to the Arctic extremely hazardous if not altogether impossible.



GERMAN TORPEDO—CARRYING SEAPLANE

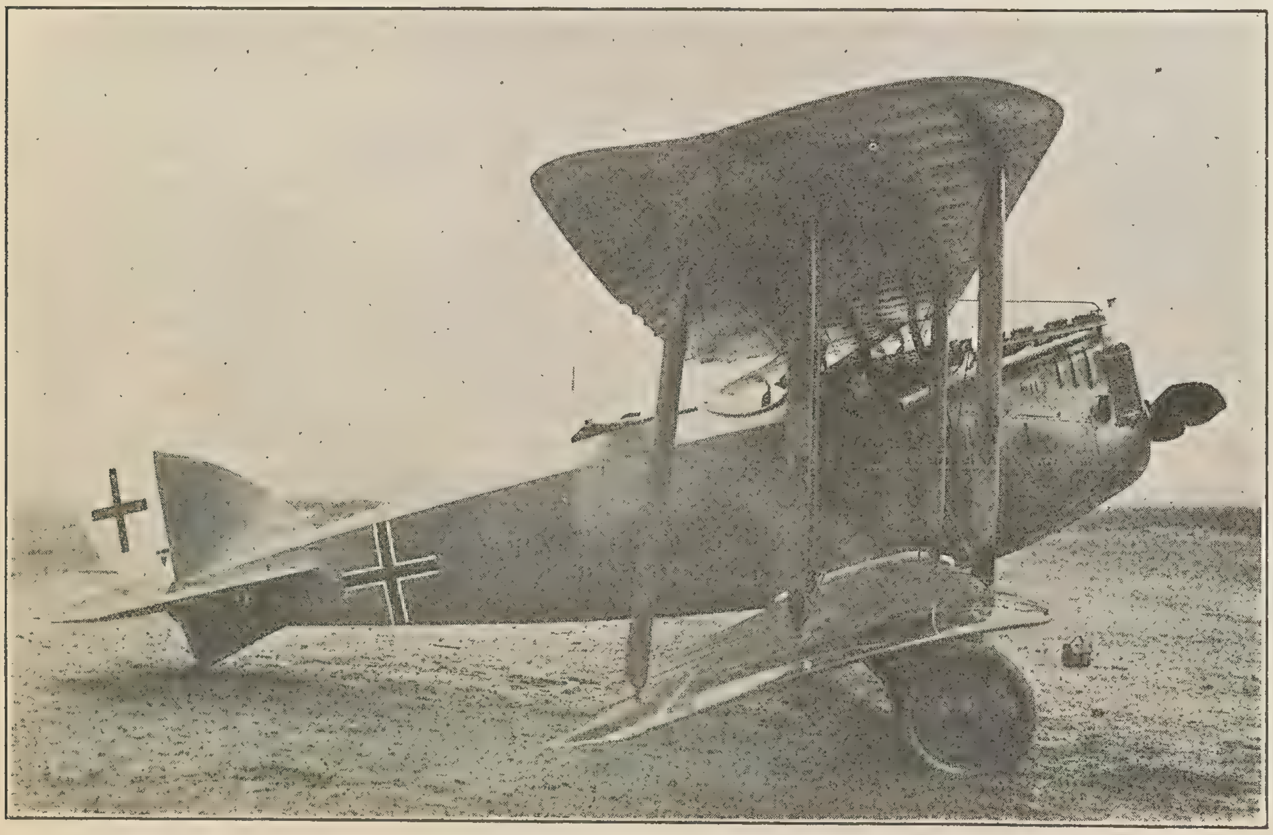
"There is, however, at least one month in the year, which offers many favorable conditions to your project, and that is the month of April. By the first of April the storms of the winter season have passed and the North country enjoys a condition of continuous daylight and by that time the weather has become comparatively mild, but the condition of the ice on the lakes and ponds is in an ideal condition to afford innumerable safe landing places.

"By the first of April the snow covering the ice has either greatly settled or entirely disappeared, leaving a hard even surface of ice upon the lakes, ponds and rivers. The rivers, however, have a tendency to break up much earlier than the lakes, and besides at swift sections of the streams, the ice is often treacherous and unsafe even throughout the winters and for these reasons the lakes would afford much safer landing places than the rivers, although with care they might also be made use of for such purposes.

"As to your route of travel, I presume one of the chief considerations would be the possibilities of obtaining your necessary supplies of high grade gasoline. There would, of course, be other important factors, requiring careful consideration, as well, but after my very brief consideration of the matter, I would think your route by way of Edmonton, the Grand Trunk Pacific and Pacific Coast, the most desirable.

"If necessary for your purpose, to use a specially high grade of gasoline, you could easily have that sent in advance by winter freight, to several points upon such route as you may select.

"It would be well, however, to give this matter very careful attention, as I learned from experience on one of my own northern journeys.



A RECENT GERMAN SINGLE SEATER— LUFT-VERKEHRS-GESELLSCHAFT

Crowell on a United Air Service

(Continued from page 3)

tain by direct contribution the entire burden of keeping alive the aircraft industry. Commercial aviation must be encouraged to carry the greater part of the financial burden, not alone in meeting the requirements of aircraft but also because of its equally important relation to the maintenance of an adequate reserve of aviators and mechanicians.

"If commercial aviation is given a fair start by suitable governmental guidance and assistance, it will require only a few years to develop into a utility of real economic value; it is believed that eventually aviation will become one of the world's greatest transportation systems. Great Britain, with splendid foresight, is evidently planning to take a lead with this utility that may be expected ultimately to place her in the same position in the air that she already holds in the remainder of the world's communication system—with her merchant marine, cables and radio. It is well understood abroad that commercial supremacy in the air will mean much more than supremacy with a merchant marine, for the merchant ship can not be converted in a few hours into a ship of war.

"The aeroplane has been developed during the war under forced draft and developed for military purposes; the element of safety has necessarily been disregarded, to a certain extent, while the element of speed and maneuverability has been accentuated, and the planes we now have all show that very plainly; and for commercial purposes we are going back to the factors of safety, which we have neglected in the development of planes during the war.

Air Department Activities

"We have certainly been at a standstill since the conclusion of the war. An air department would also look after the following:

"(1) Liaison with other Governments on all international affairs in aviation, such as laws governing international air routes and air traffic rules of the road; international codes for signals and other communication between one aircraft and another and between aircraft and surface stations; weather reports; international standards for charts of air routes, showing landing places, with their designating marks, and other necessary information for landing; international standards for day and night marks and signals for aids to navigation. It will be seen that most of the above are means of avoiding risks to life and property in aviation; they are those that help the air navigator in locating safe landing places, help him to avoid collision in the air and to avoid running into areas of unsafe flying weather.

"(2) Planning commercial air routes throughout the country, also routes to and throughout the colonial possessions. This includes the selection of safe landing places, the preparation of charts and information—similar to sailing directions—suitable for use in aircraft, and the equipping of routes with standard marks, signals and other communication systems required to facilitate their use.

"(3) Promotion of the improvement of air routes; this to be effected by arranging for legislation or other procedure that will create new landing places and thus shorten the flying distance in a route; the first route established between two points will sometimes be considerably longer than the straight-line distance, owing to the necessity for making detours around large areas, where a safe landing is impossible.

"(4) Preparation of regulations governing the use of all routes and landing places with a view to the avoidance of collision in the air and on the ground. (In the future there will be a congestion of traffic on certain routes that will necessitate special lanes of flight and uniform procedure in getting into the air and landing.) Preparation of regulations governing flight over localities where accidents to aircraft involve risk to individuals and property on the ground.

"The War Department has found that most of the municipalities are ready and willing to establish landing fields. These fields should be standardized. There should be some governmental organization to see that the fields are large enough, that they are properly laid out, and I believe they should be operated, if possible, under a perfectly uniform system. We have today nobody in the Government who can do that. In the War Department we have no authority; we have been working independently. The Navy Department has its own landing fields; the Marine Corps has its own landing fields; and we have the Coast Guard, and also the Forest Patrol, which is operating successfully in certain parts of the West, guarding against forest fires, and there may be others. We are all working separately.

"(5) Supervision of all civil schools for training pilots, as regards methods and extent of instruction in preparation for qualification for flying licenses.

"(6) Inspection of design and construction of all but Government types of aircraft as to their fitness for aerodynamical, structural, and mechanical safety in flight; issue of licenses for their operation. Periodic inspections of civil aircraft and issue of regulations for the purpose of insuring the proper care and preservation of aviation material and preventing its use when no longer in safe condition for flight. This may be the only method of avoiding failures in material that may result in loss of control, collision in the air, or fire.

"(7) Research work and experimental and test work in all branches of aviation development that are along lines common to the military and naval aviation as well as to commercial aviation. Publication of technical facts and data that will be helpful to the aviation industry and to inventors.

"(8) Cooperation with the aviation industry and scientific societies in the development of standards in quality of materials, in practices, and nomenclature; also, in so far as it will not stifle invention, the standardization of certain parts, fittings and arrangements.

Development Abroad

"This character of work is being performed by air services abroad. In England it is already started; in France and Italy parts of it are started and plans are being made for the rest of it. Besides that, the Governments abroad are helping the industry in other ways; for example, all three Governments have provided military aviators and mechanicians for missions sent to other countries to demonstrate and advertise the product of private manufacturers; such missions are now in South America and the Far East; in these projects the manufacturer is further assisted by arrangements with the Government for purchase at low prices of aviation material from the excess war stocks.

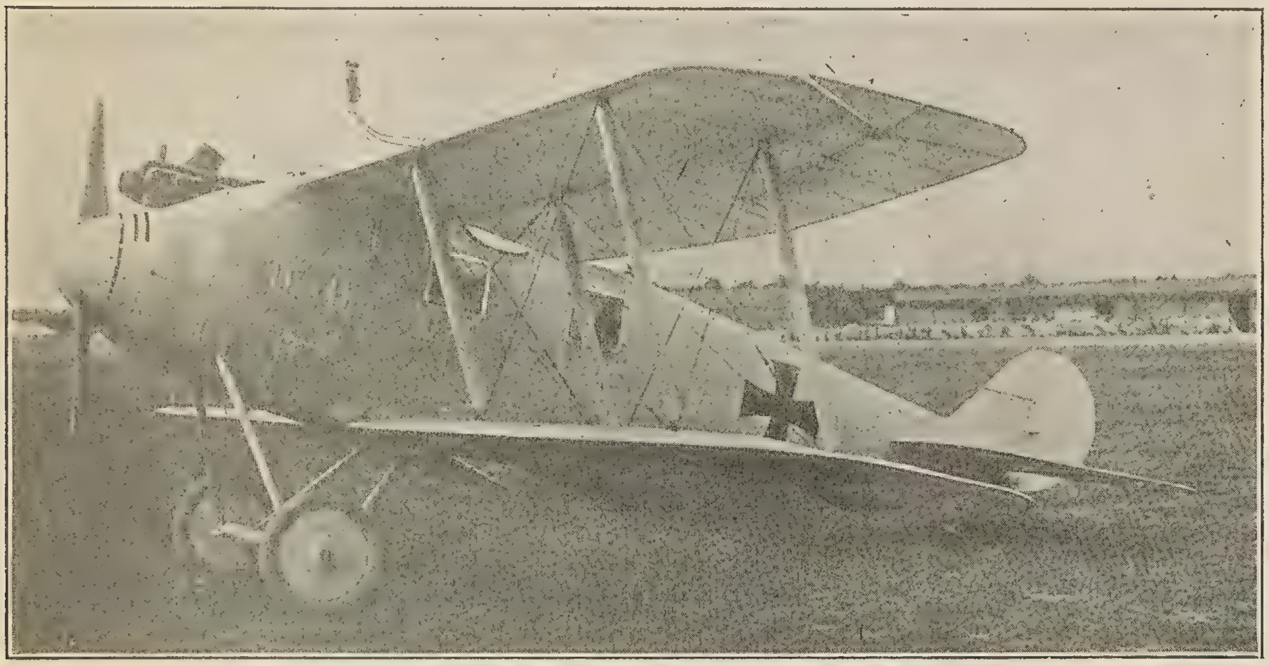
"Much is being done abroad on aerial mail routes. Although the distances in Great Britain, France and Italy inside the boundaries are not great enough to make aerial postal routes much superior in time saving to the railroads, a number of routes have already been established. In France, one route, Paris-Strassbourg, is being operated entirely with military aviation personnel and material for the purpose of gathering data in operating methods and costs. Also, at the time of one visit there was a commercial route in operation—Paris-Tille-Brussels. One member of the aviation mission flew over this route; he called our attention to the great value of all such routes as a means of training reserve pilots to complete familiarity with the appearance, not only of their own country, but also with the country of a possible enemy. One must actually fly across country in such a strange place to appreciate the full value of this relation between commercial and military aviation.

"It is a significant fact that the aeroplanes used in the French postal routes are capable of being changed quickly into day bombing machines; the receptacles for mail and parcels are so designed and disposed that they can be replaced by bomb racks without altering the flying balance of the aeroplane. This is not merely because it is an easy way to divert a war type already in production to commercial purposes, for similar provisions are incorporated in new designs built primarily for commercial use.

Advantages of a Separate Department

"A separate air department has the following advantages:

"It will save money through elimination of the duplication which exists under the present policy of having aviation developed under the Army and Navy.



(3) ROLAND C III BIPLANE

"As it is, we are providing two sets of technical men, two supply organizations, and two schools to teach even the beginning of flying. As a further important reason, the demand for specially qualified men for research and technical development are rare and their services should be made available for all the aviation work of the Government and not localized in the department to which they may belong.

"It will save delay—a factor vital in time of war. No machinery of joint boards or of liaison between services can possibly render the efficient service that would be derived in a single air department and departmental competition, which proved so harmful in the early days of the war, would be prevented.

"Congressional investigation of appropriations can be centralized and the embarrassments that come from the present control by several committees on this subject will be eliminated.

"It is proposed to unite in a single air department the following aviation activities:

"(1) Aeronautic research and experimental work of the classes that have a general application in all organiations utilizing aviation, commercial as well as governmental.

"(2) Supply of aircraft material for all governmental branches that use aircraft; this includes liaison with the aircraft industry that will permit the maintenance of plans for mobilization of the industry in time of war.

"(3) General training, namely, that kind of practical and theoretical aeronautic instruction which is common to all branches of the Government employing aviation personnel.

"(4) Supervision of all matters relating to commercial aviation which require Federal guidance and encouragement.

"Under the head of the air department there should be the following four divisions charged, respectively, with the above four activities: (1) Technical, (2) supply, (3) general training, (4) civil aviation.

Specialized Branches

"In addition to the above-mentioned divisions there should be organized in the air department an air force with two functions —raiding and fighting—these functions are specialized branches in air warfare that are distinctly different from the military and naval aviation specialties like reconnaissance, control of gunfire, etc. The pilots for this force need have very little Army and Navy knowledge and training and, therefore, it would be necessary to obtain only a portion of the officers for this force from Army and Navy personnel.

During the war both our Army and Navy had forces of this kind, although the Navy's force (northern bombing group) was organized on a comparatively small scale. But that duplication of effort certainly should not be repeated; the raiding and fighting force, for economy and efficiency must be under one head; the reasons for placing this force under the Air Department instead of under either the War or Navy Departments are as follows:

(a) By assigning the air force to a department whose sole reason for existence is aviation, certainly better attention to its needs will be assured than if it were assigned to either the War or Navy Department where aviation can not escape being looked upon as an auxiliary.

"The creation of a separately organized air force will offer an opportunity to such officers of the Army and Navy who desire to do so and who are suitable, to make this service their life's work. If this kind of an air force is not organized separately from the Army and Navy it can always be controlled by officers who are taking up aviation work as a temporary assignment (often with no real aviation knowledge, practical or theoretical), while the chief hope in their professional lives is the eventual command of armies or fleets. Certainly far better progress in the tactics of air fighting and raiding, and a far better esprit will be attained, if the controlling positions in this force are held by officers who have no thought for the future other than aviation.

"(b) In time of war the personnel of this force must be rapidly expanded to comparatively enormous proportions. We must look to commercial aviation for the personnel for this increase. The air force, through the air department, through licensed civilian fliers, will have a better liaison with the source of reserve pilots than could be effected by any existing machinery in the War or Navy Department organizations.

Conversion to Military Types

"(c) A large proportion of the aeroplanes that will be used for commercial purposes will be suitable for conversion into raiding types. As the air department will certify all commercial aeroplane designs prior to their use, the air force, through the department of which it is a part, can properly guide this design along lines that will make these types immediately convertible into war material.

"It is unfortunate that an air force of this kind is frequently called an independent force; the word 'independent' is often construed as meaning that this force, in time of war, would be a sort of free lance. As a matter of fact it should be independent only in its organization, administration, discipline, and in its tactical development, precisely as the Marine Corps is independent of the other fighting service. It may, and doubtless will, engage in independent war operations especially prior to mobilization of the Army or Navy, but it would cooperate with either the Navy or Army in the same manner that the Marine Corps supports the strategy of that arm which requires it.

"In order to keep the technical division in constant touch with the needs of the Army and Navy, it is suggested that flying officers from these two services should be detailed for service with this division. Similar details should be made from the air force to the technical division. This division should also be prepared to carry out special research and experiment at the request of any other department using aircraft.

Supply Division Duties

"It will be the duty of the supply division to act as the organization for supply of aircraft material for any department authoried by Congress to acquire aircraft. Provision should be made for the detail to this division of representatives of each department to aid in understanding and filling the needs of their services. Actual production of planes and motors will be carried on almost entirely in private establishments, in order to encourage competition and to give a broad basis for a greatly enlarged supply in case of war.

"It is recognized that most of the ground training of a flier and a part of his training in the air are of the same character, whatever the ultimate nature of his duty. So far as this training is common to the various departments, it will be obviously a saving of money and effort to have it under one control and thus prevent duplication both of organization and of physical facilities. In order to secure the fitness of this training to the ends to be reached it is suggested that in this division officers of the air force be detailed for service as instructors.

"Under the division of civil aviation should come not only the control of civilian flight within the national boundaries but the whole field of international flight within the national boundaries and the whole field of international flight, including such administrative action as may be needed to put into force the provisions of the international convention, should that be ratified. It will be to this division that foreign aeronautical authorities and foreign nationals wishing to fly across our boundaries will be directed for information. The making of maps, the control of aerodromes, the establishment of rules of the air, inspection and other provisions for safety, and the publication of information will be among its duties.

Supported by Precedents

"The foregoing plan is suggested as meeting the existing difficulties of loss of motion between the various air activities and lack of central authority to control and administer the whole subject of air transport in the United States. It should be emphasized that activities of such enormous importance for the future, and of such necessity for the present plans for national defense, should not be hampered or crippled by division of authority among several departments, or (which would be still more harmful) obscured and neglected by being intrusted to a mere bureau of an existing department.

"As the proposed air department will have as one of its most important functions the supply of material to several great departments, such an arrangement is perfectly logical; and the plan of creating for the purpose an independent office is supported by the precedents of the Shipping Board and the Interstate Commerce Commission.

* * *

Duplication in Training

There is tremendous duplication in the training of the men whether to fly over the land or over the water. The men should be taught by a central department and they could be taught better and more economically.

* * *

"I have never heard any difference of opinion among those who have given careful thought to the matter. Among the Army or Navy or the civilians I have never found any difference of opinion as to the primary training of fliers.

* * *

"Under my plan, this new Air Department would have submitted to it by the Army and Navy and by any other outside bodies their estimates of aviation appropriations so they could be submitted to Congress. The War Department would control its funds, just as it does today, and the Navy Department would control its funds, just as it does today. The Department of Aviation would control everything except observation squadrons which would be left in the War Department and the observation squadrons which would be left in the Navy Department. My conception is that the War Department and the Navy Department would figure the appropriations that would be necessary for the purpose for the year to maintain their aviation department which would consist merely of observation planes. They would then hand that over to the director of aviation who would include that in his estimates for his department. These would then go to Congress and the Army men would be estimated for by the War Department and the Navy men would be estimateed for by the Navy Department and the Air Service men would be estimated for, but it would be included in one lump sum, one amount; there could be no such condition as I am told exist where one committee has appropriated for aviation without the knowledge of other appropriations for the same purpose.

"There should be a congressional committee on aviation which would handle the aviation appropriations.

Study Leads to Conversion

"I find that the more study given by an

(Continued on page 10)

L. D. GARDNER. . .President and Editor
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Formerly Air Service Journal

Mexico Trying to Buy Airplanes

MEXICO is buying airplanes wherever she can, is the well founded report in Washington. Carranza sent an envoy by the name of Aguilar to Italy to secure, if possible, Italian aircraft equipment. Through one of the most fortuitous circumstances, the matter came to the attention of the United States Embassy. Premier Nitti was informed about the case and Aguilar soon left the country only to be stopped again in Belgium. A few pursuit machines of late European design in the hands of the Mexican Air Service would cause an unpleasant chill to run along the Border.

Representative La Guardia brought out this interesting information in questioning General Mitchell at the recent Aviation Committee hearing. He asked:

"Are you aware of the fact—speaking about Mexico—that it is getting its equipment from Europe; are you aware of the fact that Aguilar, who was the special envoy of Carranza in this country, whom I mentioned in my speech in July, left this country for Europe, ostensibly for the purpose of going abroad for medical treatment, and was equipped with credentials as an envoy and went to Italy incognito, that through a letter being directed erroneously, addressed to the United States of Mexico, this letter came into the hands of our embassy at Rome, and Mr. Peter Jay, our charge de affairs, called upon Premier Nitti, of Italy, to inquire the purpose of Mr. Aguilar in Italy, and obtained information that Aguilar was trying to buy arms, munitions, and air equipment, and that Premier Nitti assured Mr. Jay that Italy refused to sell any to Aguilar; that that information was communicated to the State Department; that Mr. Aguilar then left Italy and later we learned he had succeeded in purchasing a large amount of guns and ammunition from the Liege munitions factory in Belgium and we succeeded in stopping the shipment of that purchase. Are you aware of that?"

General Mitchell replied that he had heard the rumor.

Landing Runs

WHILE among the most important points in the design of an airplane are the lengths of landing runs, and while the economics and dynamics of the airplane have been treated in every conceivable way, it is peculiar that we have not so far developed even the most elementary methods of obtaining by calculation lengths of landing runs, or of determining what are exactly the factors which go to make up a short landing run.

It is quite possible, however, to secure an idea of what these factors are without mathematical treatment.

Consider a machine which has made a good three point landing; that is, one in which a recovery has been made from a dive, and the machine being placed in a stalled attitude, with engine off, gently sinks to the ground with front wheels and skids touching the ground simultaneously.

The machine has a certain amount of kinetic energy which must be absorbed by the effect of air resistance and tractive resistance of the wheel and skids. Since the attitude of the machine remains unchanged during the run on the ground, the air resistance will be proportional to the square of the velocity and the tractive resistance will be proportional to the weight of the machine, minus the remaining lift of the wings, it being assumed that the tractive coefficient of the ground remains the same.

It is evident that the lower the wing loading, and hence the speed of the machine on landing, the lower is the velocity and length of landing run. Low wing landing would seem to be a necessity where a short run is involved.

The next factor involved is the resistance of the plane in the landing attitude. It is quite clear that the wings in this case must be at as large an angle as possible. This means that for a short run, the wings should be at a large angle of incidence to the body, and also the angle between the wheel base and the skid should be as large as possible.

The provision of skids which, without too much damage to the ground, will nevertheless provide a considerable drag is the next possible step. It is interesting to note in this respect how successful the use of a drag skid in front of the machine has been on a couple of well known models.

The use of air brakes seems fraught with difficulties and complications. It would seem as if in the commercial machine, it would be possible to secure a short landing run by design features alone without extraneous complications.

New Airplane Cannon

INFORMATION regarding aircraft armament which has been treated as confidential heretofore is gradually being given to the public. General Mitchell stated to the La Guardia Aviation Committee that at McCook they had developed a 37 millimeter cannon for airplanes that was better than anything he had seen overseas. He told the Committee that "the 37 millimeter is a cannon, with a projectile of about 1½ pounds weight. It can use high explosive shells or it can use an armor-piercing projectile. It can use percussion shells, which can be used against large aircraft, such as Zeppelins or things of that kind, against large airplanes, against tanks on the ground, or any equipment that is armored in about the same manner. This gun shoots at the rate of 1100 shots a minute, and it charges with 10 projectiles at the same time. Our 50 calibre machine gun will be supplied with the Browning mechanism, and has an initial velocity of 2400 feet a second, and will also have five kinds of projectiles that it can use. It will shoot at the rate of about 700 a minute, and its ammunition will weigh about 25 pounds to the hundred rounds. It will pierce any armored airplane that now exists."

The obvious question that occurs to everyone who knows American resources is—when shall we get airplanes to mount these excellent guns on?

Commercial Uses for a Ship's Airplane

THE Friedrichshafen Aircraft Works, on Lake Constance, was during the war very successful in producing seaworthy aircraft for the German navy. It is now turning its attention to commercial work.

This firm has a number of suggestions to offer for the commercial uses of a ship airplane. A ship plane would enable a vessel without going into port, or any loss of time, to put ashore, or take on board, single passengers, or mail. Ship's papers could be sent ashore ahead of the arrival of the vessel. Mail can be brought on board ship several hours after leaving port. In case of accident the ship plane might be used for obtaining assistance quickly. Salvage companies might use a ship plane to send an engineer post haste to a wrecked ship, where he might land on deck or sea to investigate.

There is no doubt that with the development of the ship airplane, these commercial uses will follow.

"ACES" STILL IN THE AIR SERVICE

A recent statistical report shows that at the present time there are attached to the Air Service nine of America's 68 "Aces." These officers are credited with five or more victories. The list of nine includes the following:

Capt. Field E. Kindley, who is a native of Gravette, Ark., was attached to the 148th Aero Squadron. Captain Kindley worked with the British and is credited with twelve victories. He was decorated with the Distinguished Service Cross with Oak Leaf, also the Distinguished Flying Cross.

Capt. J. O. Donaldson, a native of Washington, D. C., and who saw service with the R. A. F., is credited with eight victories. He also was decorated with the Distinguished Flying Cross.

Major Reed M. Chambers, who is credited with seven victories, was attached to the 94th Aero Squadron and has been decorated with the Distinguished Service Cross and Croix de Guerre.

Capt. H. Weir Cook, a native of Toledo, Ohio, was attached to the 94th Aero Squadron. He was decorated with the Distinguished Service Cross with Oak Leaf and has seven victories to his credit.

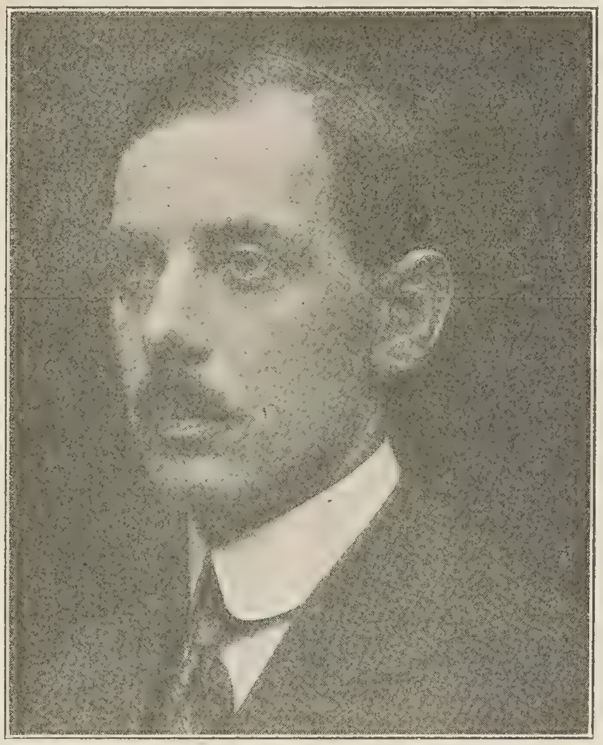
Capt. Martinus E. Stenseth, Twin Valley, Minn., was attached to the 28th Aero Squadron and is credited with six victories.

Capt. James A. Healy, who was decorated with the Distinguished Service Cross with Oak Leaf and Croix de Guerre with three Palms, is a native of Jersey City, N. J. Captain Healy was attached to the 147th Aero Squadron and has five victories to his credit. He is at present on duty in the office of the Director of Air Service.

Capt. Clayton L. Bissell, a native of Kane, Pa., was attached to the 148th Aero Squadron. He was decorated with the Distinguished Flying Cross and has five victories to his credit.

Capt. Arthur R. Brooks, of Framingham, Mass., was decorated with the Distinguished Service Cross and has five victories to his credit. He was attached to the 22nd and 139th Aero Squadrons.

1st Lieut. Harold H. George, a native of Niagara Falls, N. Y., was attached to the 139th Aero Squadron. He was decorated with the Distinguished Service Cross and has five victories to his credit.



LYMAN J. SEELY

JOINS THE BOYCE-VEEDER

James A. Abels, well known in the automotive field as former Vice President and General Manager of the Motor Car Equipment Company, and more recently, organizer of an eastern house for the Beckly-Ralston Company, of Chicago, has recently joined forces with the Boyce-Veeder Corporation which will manufacture and make the new Boyce Fire Extinguisher.

LYMAN J. SEELY, AVIATION PIONEER

Lyman J. Seely is one of the early pioneers of aviation. His early association with aeronautics dates back to 1907 when he bought a small two-cycle engine from G. E. deLong of Elbridge, N. Y. and started developing it for aeronautical uses. This engine developed 90 hp. and weighed less than 250 lbs. Among the early purchasers of this engine may be mentioned Glenn L. Martin, Charles Walsh, Jack Friesbie, William Evans and Charles Morok. Altogether some 240 engines were produced during 1910 and the early part of 1911.

A slump having then occurred in aviation, owing to several fatalities, Mr. Seely started making marine engines. In January, 1913, Mr. Seely joined the Curtiss Aeroplane & Motor Corp. in capacity of Sales Manager and remained until July, 1914, when he went to Europe to sell American airplanes and engines.

After securing large British orders, Mr. Seely returned to this country and has lived in Hammondsport since engaging in various enterprises.

COLLEGE AIRPLANE RACE

Columbia, Harvard and Yale will take part in a three-cornered airplane race next spring, if plans discussed at a meeting of the Columbia Aero Club recently are successful. The proposed contest will be modelled on the New York-Toronto air race.

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STRENGTH REPUTATION SERVICE

Crowell on a United Air Service

(Continued from page 7)

officer of the Army, the greater his tendency to swing in the direction of an outside independent department of air. The action of the board headed by Gen. Hahn quite recently was, perhaps, a good example of that. This board was appointed by the Secretary of War during the summer to report to him on the bills which were then before Congress. The New bill, I think, and the Curry bill were the two specially mentioned. This board consisted of Gen. Hahn, Chief of the War Plans Division of the General Staff; Gen. Snow, Chief of Field Artillery; Gen. Coe, Chief of Coast Artillery; and Gen. Menoher, Chief of the Air Service When the board was appointed the general comment was that a more conservative board could not possibly have been discovered, and by conservative I mean a board which would be the last to change existing organiations. The members of the board have told me that their opinion at first was exactly as I have stated, but as they gradually studied the subject they have changed their minds and they finally recommended a centralized independent department for certain things. Of course Gen. Menoher has been one of the irreconcilables from the start, and is today, and it started with his influence, which is very large. There is no better officer in the army. But in spite of that, this board, after long and careful study, made the report I have described. They made a canvass of the officers of the Army—which I have considered perhaps the most authoritative body to report on this, because they are soldiers—and asked their opinions, and, much to my surprise, I found that the following officers have come out and unqualifiedly favored a separate department. I have quite a list of officers, and I am not going to read the list because of its length but because of its quality. It is headed by Gen. Liggett; he is one of the very best men in the Army. Gen. Joseph E. Kuhn is on the list; he was president of the Army War College from January, 1917, to August, 1917, and he commanded the Seventy-ninth Division. I wish to say, too, that all of the men on this list saw active service in France. Maj. Gen. George W. Reed, Maj. Gen. William H. Hay, Maj. Gen. Peter E. Traub, Maj. Gen. Clarence R. Edwards, and Maj. Gen. Leonard Wood are also in favor of a separate air department. I have just mentioned a few of the higher grade officers, and it is rather surprising unless these happen to be men who have given the most study to it."

Brig.-Gen. William Mitchell's testimony before the Committee will be printed in AIRCRAFT JOURNAL of December 27.

Reasons for the Race

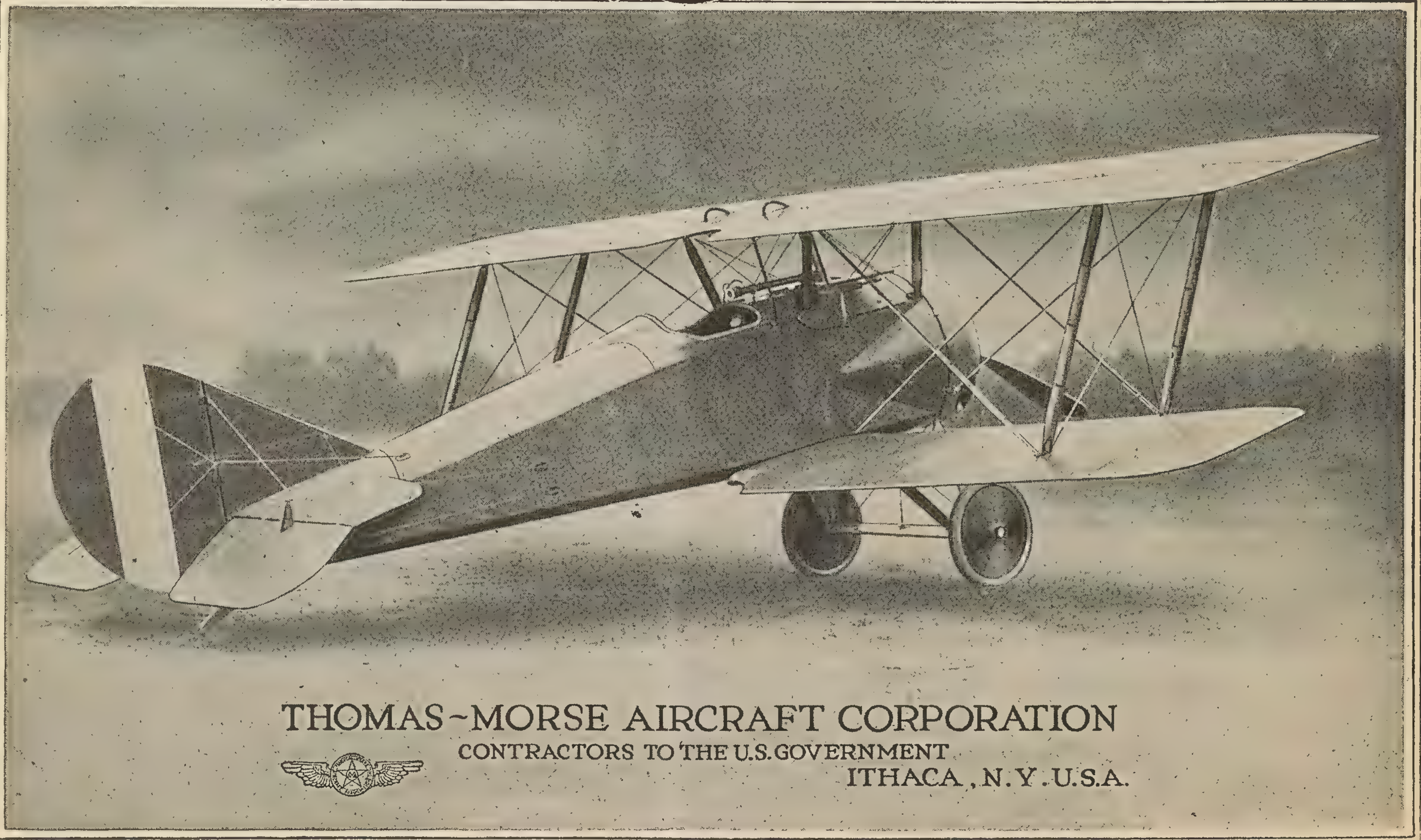
Brig. General William Mitchell, Chief of Training and Operations, in a recent report gave the following reasons for the inauguration of the recent Transcontinental Race:

It requires very little consideration on the part of even the most casual observer of things aeronautical to determine the reason for holding the New York-San Francisco reliability test. In many ways it can be compared to a field maneuver carried out by one of the army services, but it was calculated to yield a far greater profit to the Air Service and to the cause of aeronautics in general than any field maneuver ever did before.

To appreciate fully what this test meant at this particular time, one should make a brief survey of the Air Service as it stood at the outset of this test, depleted of a great percentage of its most valued personnel, cumbered with piles of obsolete motors, planes and materials, and scattered to the four corners of the nation in widely separated, deserted flying fields. To determine just what could be done by this war remnant of an aeronautical machine, the Director of Air Service saw fit to set up before this organization a small problem much in the same way as one prepares a small problem in tactics for a maneuver, and that problem was the Air Service reliability test.

Accordingly, the conduct of the test fell to the lot of the Training Department. It was to be an examination of the personnel efficiency, a close scrutiny of the existing mode of organization and administration, a precursory but penetrating survey of the supply system as it stood, its distribution and control, a test of American methods and communications, a sweeping experiment of machines, motors and instruments, far-reaching exploration into new fields of air travel, with its attendant search for landing fields and research into things meterological, insofar as concerns navigators of the air.

Over and above all this, and unlike any ordinary tactical scheme, it was estimated, and this was certainly justified by facts, that it would awaken a new interest in aviation in this country, reveal to the world not only the possibilities, but the problems thereof, and the immensity of the task which lies before those whose duty it is to master and develop this new and powerful arm of national defense, which promises to equal in importance the land and sea forces. Thus, in one problem, the Director hoped to train and test personnel and gain information that would lead to further development.



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Flies from England to Australia

Capt. Ross Smith Makes 11,500 Mile Trip Within 30 Days and Wins $50,000 Prize

Capt. Ross Smith, the Australian aviator, arrived at Port Darwin, Australia, Dec. 10, from England, thus winning a prize of $40,000 offered for the first aviator to make the trip. The Sydney Sun also gives a prize of $10,000.

Under the conditions laid down by the Australian Government when it offered a prize for making a flight from England to Australia the distance of 11,500 miles had to be covered within thirty days.

Cruisers and steamships kept watch at sea on the last stage of the airman's journey, vessels patrolling between Timor and Port Darwin. Elaborate preparations were made at the landing at Fannie Bay, three miles from the port.

The Austrlian premier, William Morris Hughes, sent a congratulatory message for presentation to Captain Smith when he had completed his journey.

Capt. Smith left the Hounslow aviation field, near London, at 9 o'clock November 12 on his flight to Australia. On November 18 he reached Cairo and on November 19 he continued his flight and on November 23 he reached Delhi, India. From there he continued east until he reached Rangoon, turning southward at that city, making a number of stops along the Malay Peninsula and in the Islands of Oceanica. He arrived at Bima, on Sunbawa Island, near Java, Monday night.

Smith's only serious competitor was Lieut. Etienne Poulet, the French military aviator, who left Paris on October 14, near a month before Smith started from London. The Englishman caught up with Poulet in India, the aviators meeting in Rangoon on November 30 and both leaving for Bangkok on December 10th. The two airmen started off nearly together from Bangkok the day following. No reports have been received as to the whereabouts of the French aviator after leaving Bangkok.

Captain Smith's Log

Capt. Ross Smith's diary of his great flights as far as Singapore has been printed by the New York Sun through the courtesy of the Sydney Sun. It follows:

Lyons, Nov. 12—Arrived here 3:40 in the afternoon. Misty out from London but the Channel was clear. Encountered a heavy cloud of snow at Etaples, climbed to 8,000 feet and flew compass course. Next saw grounds three hours later over Roanne, after meeting further snow and intense cold. Instruments were frozen and the machine covered with ice, food too frozen to eat. From Roanne the ground was visible at times. Very relieved to see the spire of Lyon. There was a favorable wind but much time was wasted dodging storms. Machine behaved splendidly.

Pisa, Nov. 14—Left Lyon at 10 o'clock. Fine weather with sunshine all the way; a few heavy clouds but otherwise it was a perfect flying day. I flew along the coast, crossed the Gulf of Genoa and landed at Pisa at 2:40. Alps looked very fine in the sunlight.

Rome, Nov. 15—There was a heavy rain at Pisa. Aerodrome under water. Attempted to start but got bogged and had to spend the day on the machine. Had the engines running at 8 o'clock and taxied out on the planks. Italian mechanics helped to extricate the machine. Sensational start. Bennett held the tail down until the machine was moving, then he made a running jump at the rear cockpit and was hauled aboard by Shiers of the crew. As machine left the ground it rose beautifully. Crew was wet but cheerful. Encountered a strong head wind and speed was only fifty miles an hour. Hazy weather. Made a bumpy landing at Rome at 3 o'clock.

Runs Into Bad Weather

Canea, Nov. 17—Left Rome yesterday morning 9 o'clock; landed at Taranto 11:45. Again low clouds and visibility bad. Passed over Capua and Naples and then turned east over the mountains. Flew over Vesuvius, but weather was too bad to photograph. Very bumpy over the mountains, machine falling several hundred feet at times. A good wind helped us. Greatest assistance afforded us at Taranto. Spent afternoon on machine. Suda Bay reported good, so decided to land there to avoid a long sea stretch. Left Taranto at 2 today and arrived at Suda 3:45. Strong wind on our bow with low clouds and rain all the way to South Greece. Attempted to get above the clouds, but they were too high, so flew at 800 feet following coast. Nearly hit a small island in the mist from south Greece to Crete. Good weather with slight head wind. Aerial route station here is giving all assistance. Crew is fit. Hoping for better weather. Now much warmer.

Cairo, Nov. 18—Left Suda Bay at 8 today, arrived at Cairo at 3:30, weather again is bad. Low clouds made the crossing of the Crete Mountains difficult. Wind was slightly favorable. Steered on a south course after leaving but had to fly through rain at 2,000 feet most of the way across the Mediterranean. Passed two steamships half way.

Crossing took two and a half hours. Struck African coast, then flew east to Cairo across the desert via Matrah and Wadinatrum. All are very well pleased to have got here and hope for better weather now. So far we have taken thirty hours, mostly through rain and storms. Throughout the greatest assistance was rendered by aerial route stations, nothing being too much trouble. It is largely due to their excellent organization that we have come here so soon, the Vimy going perfectly.

Flies Over Sea of Galilee

Basra, Nov. 22—Left Cairo on the 19th at 10:30. Dull weather. Crossed Canal at Kantara, then over Romani along the coast under a thick cloud to Gaza, turned inland to Ramleh then Haifa. Owing to the heavy rain, flew low to the Jordan over the Sea of Galilee, thence to Damascus. Interesting to see the old places again, recalling memories of the war. Landed at Damascus at 3. Met many old R. A. F. friends. First rain since March. Ground getting sticky. Oiled tires to stop mud sticking and left. Flew low to Tadmur, turned east and crossed desert to Abukemal, followed the Euphrates, met head wind and landed at Namadie battlefield at dusk. Pegged down machine. Heavy gale at night, turned out troops to hold machine; anxious time for two hours, but Vimy weathered storm.

On twentieth left Ramadie at 1:15. Good winds; first good flying day of journey. Passed Bagdad, Kut, Garden of Eden, and landed at Basra at 4:40. Overhauling today. Yesterday's weather cheered all considerably after ten days of trying conditions. Crew well. Engines behaving beautifully.

Benderabbas, November 23—Today perfect day. Beautiful sunrise. Flew over Bushire, along coast of Persian Gulf, landed here 2:20. Nearly eight hours in air, machine never faltered. Persian coast very rough and barren. Passed several R. A. F. emergency grounds. Welcomed at Benderabbas by British consul and local Persian Governor. Great interest manifested by local inhabitants. Some had never seen aeroplane. Hope to reach Karachi tomorrow if winds are favorable, otherwise Charbar.

Karachi, November 24—Left Benderabbas today 7:30, arrived at Karachi 4:10. Good day, but uninteresting scenery. Followed

(Continued on page 14)

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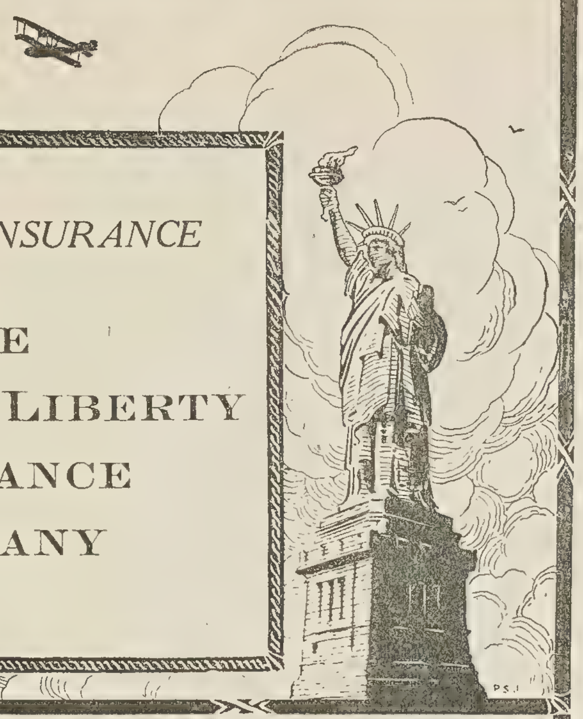

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Capt. Smith Flies from England to Australia

(Continued from page 11)

coast all the way. Engines and machines no trouble. Crew rather tired after nearly nine hours flying. Welcomed to India by Gen. Fowler and air force, also a party of Australians, who cheered lustily. Weather much warmer in contrast with England thirteen days ago. Hope to reach Delhi tomorrow if wind is favorable.

Arrival at Delhi

Delhi, November 25—Left Karachi today 7:40, arrived at Delhi 4:30, journey uneventful, good day, slight head wind. Met by Gen. MacEwan and numerous others. All air force arrangements perfect and the greatest assistance. During last three days have flown twenty-five hours, covering 1,600 miles with machine and engine, no trouble. Crew well.

Singapore, Dec. 4—At Bangkok the greatest assistance and courtesy were shown by Prince Pitsanoluke and Aviation Corps. Left Bangkok on the 2nd at 7 and arrived at Singora at 1. Escorted for first fifty miles by four Siamese machines. Course was south, along east coast of Malay. First two hours were good. They met a heavy monsoon rain with wind strong and changeable, sometimes helping and sometimes against. For three hours, following the coast, was almost blinded by rain, but country was impossible for landing and had to continue, hoping for the best. Worst flying conditions ever encountered. Last hour was better. Aerodrome at Singora bad and stumpy. Had to land in a cross wind in a small, dry patch. Safely down with luck. Later in taxying the machine tail skid caught in root and broke fitting. Not serious. Great interest by local population, seeing first aeroplane. During night heavy squalls. Crew held machine all night. Great assistance and hospitality from Prince Yugala and local officials. On December 3 a torrential rain with wind. Repaired skid. Crew wet through, but worked on machine all day. Patrol arrived in evening; raining too hard to put in. Today my birthday. Weateher is bad, but decided to try for Singapore.

Left Singora at 10, arrived at Singapore at 5. Take off at Singora very rough. Convicts had cleared the stumps yesterday, but aerodrome very wet in patches. Got off in cross wind, rain all the way. Flew 2,000 to 500 feet all the way. Great reception here;; huge crowd. Hope to arive at Darwin on 10th.

SECY. DANIEL'S REPORT

Referring to the navy in spanning the Atlantic by air, the crossing of the British dirigible, the flight from New Foundland to Ireland of the Alcock plane, and the feat of several U. S. Army aviators in flying from New York to San Francisco and return, Mr. Daniels, in his annual report, has this to say of the future of aviation:

"The notable advance in aircraft of all types, acquisition through war experience of thousands of trained aviators, operation of mail and passenger planes—all these point to a development that will make aeronautics a means of swift transportation, bringing continents closer together and reducing the trans-ocean voyage to hours instead of days."

The navy now has a Reserve Flying Corps of 4,000 officers and 20,000 men. It was thus able, after the war, to assign a fleet-air detachment to the Atlantic fleet at Guantanamo during its manoeuvres there, consisting of six twin motored flying boats, three single-scout airplanes and a big division of kite balloons, with the United States ship Shawmut as mother ship.

Mr. Daniels described the building at Lakehurst, N. J., designed for the construction of the navy's future dirigibles, and the helium plant at Fort Worth, Tex. He says the helium plant for the manufacture of helium gas, when completed, will cost $5,000,000, and will have an output of about 40,000 to 45,000 cubic feet of gas per day. This is the gas that was to have been used in dirigibles in the European war for an attack on Berlin by American forces. Helium gas is non-inflammable.

LONDON-PARIS LUXURY.

The first of the real commercial planes has been put into commission for the London-to-Paris service. It has all the luxuries of a Pullman car, with a fine salon fitted with carpets and fifteen windows.

Passengers sit in velvet cushioned arm chairs, with receptacles at their elbows for maps, books and papers. A handsome clock and ornate mirrors give a tone of elegance to the interior, which is lighted by electricity.

In addition to wireless telegraph there is a wireless telephone equipment connecting with land stations. There are also a spacious luggage room and pilot's cockpit. The machine is designed to carry two tons and eight hundred weight when fully loaded. Two engines of 450 horse-power propel the airplane.

The London-to-Paris service is now in its fourth month with increasing patronage, both passenger and freight.

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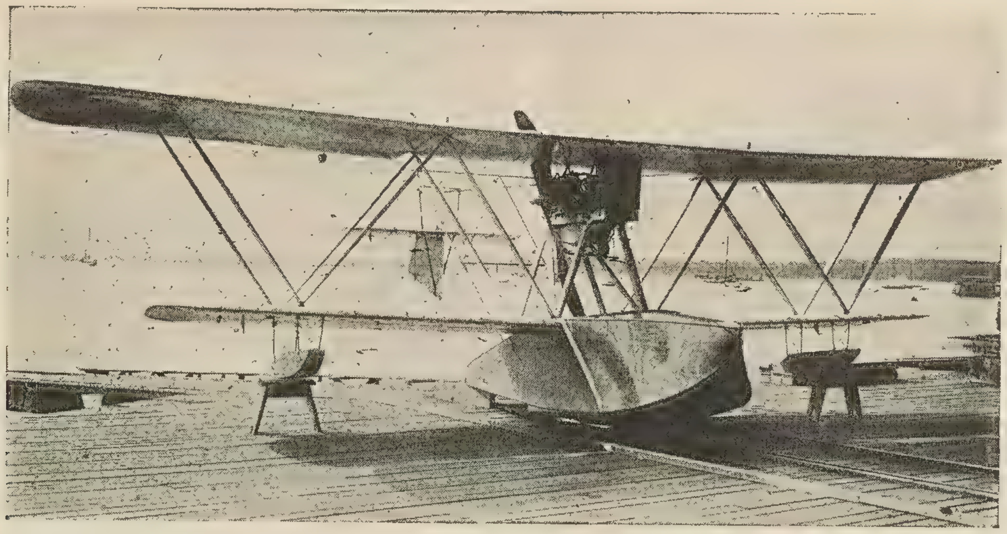

¶ The unrivalled character of the Design and Performance, of course, goes without saying.

¶ We invite your attention to the Desirability of Possession—assuring you of reasonable First Cost and negligible Operating Expense.

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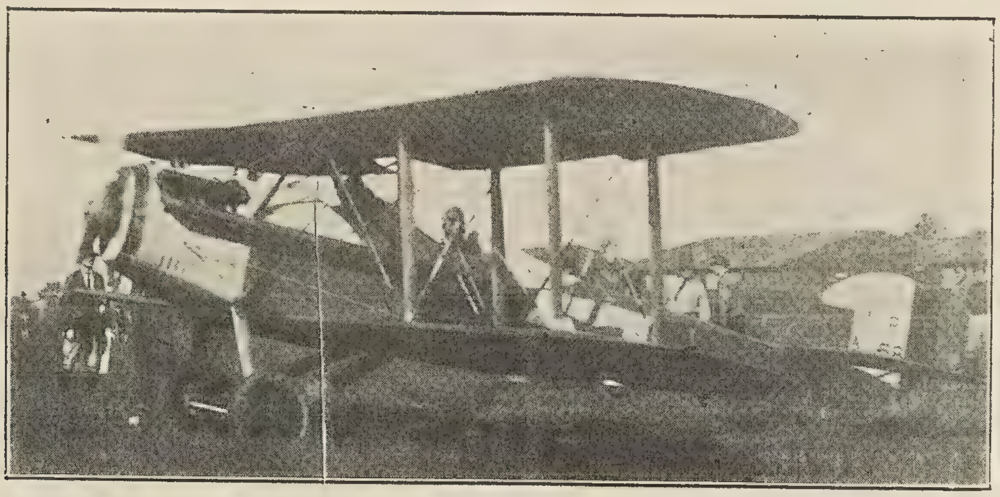
The Vought VE-7 2-Place Training and Sport Airplane—



¶ VE-7, Maj. R. W. Schroeder, U. S. A. pilot, won the New York-Toronto International Airplane Reliability Handicap Contest.

¶ Adopted by U. S. Army Air Service as the Standardized Advanced Training Type.

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The ORIOLE

WHAT goes to make the ideal aerial runabout? Smartness, convenience, economy, speed, comfort and ease of control—with no nervous tension—you can talk, read, write or even sleep—it is a gentleman's air-craft. Furthermore, the *Oriole* is equipped with a "SIX", and carries seven hours' fuel at economical speed.

It has been developed by the organization which furnished Canada and the United States with training machines for 95% of their cadet flyers, by the company which constructed the Navy-Curtiss flying boats, masters of the Atlantic.

The graceful and effective lines of the orange and black *Oriole* take the eye of everyone who knows and appreciates style. The appointments of the machine fulfill the promise of its appearance. A door in the fuselage just above the lower wing swings open to admit the passengers into a roomy, cushioned apartment. The pilot's "cockpit" is just to the rear. A self-starter is there for your convenience. Protection from wind and noise is afforded by the windshield and the scientifically shaped fuselage.

With a 90 H. P. motor the *Oriole* attains a three-passenger speed of 85 m. p. h. This is remarkable in relation to load and horse power employed, and with respect to economy. The gasoline cost per passenger mile in the *Oriole* is but 1 1/10 cents! With a Curtiss "Six" Motor, 150 H. P., the speed of 95 m. p. h. is no less remarkable.

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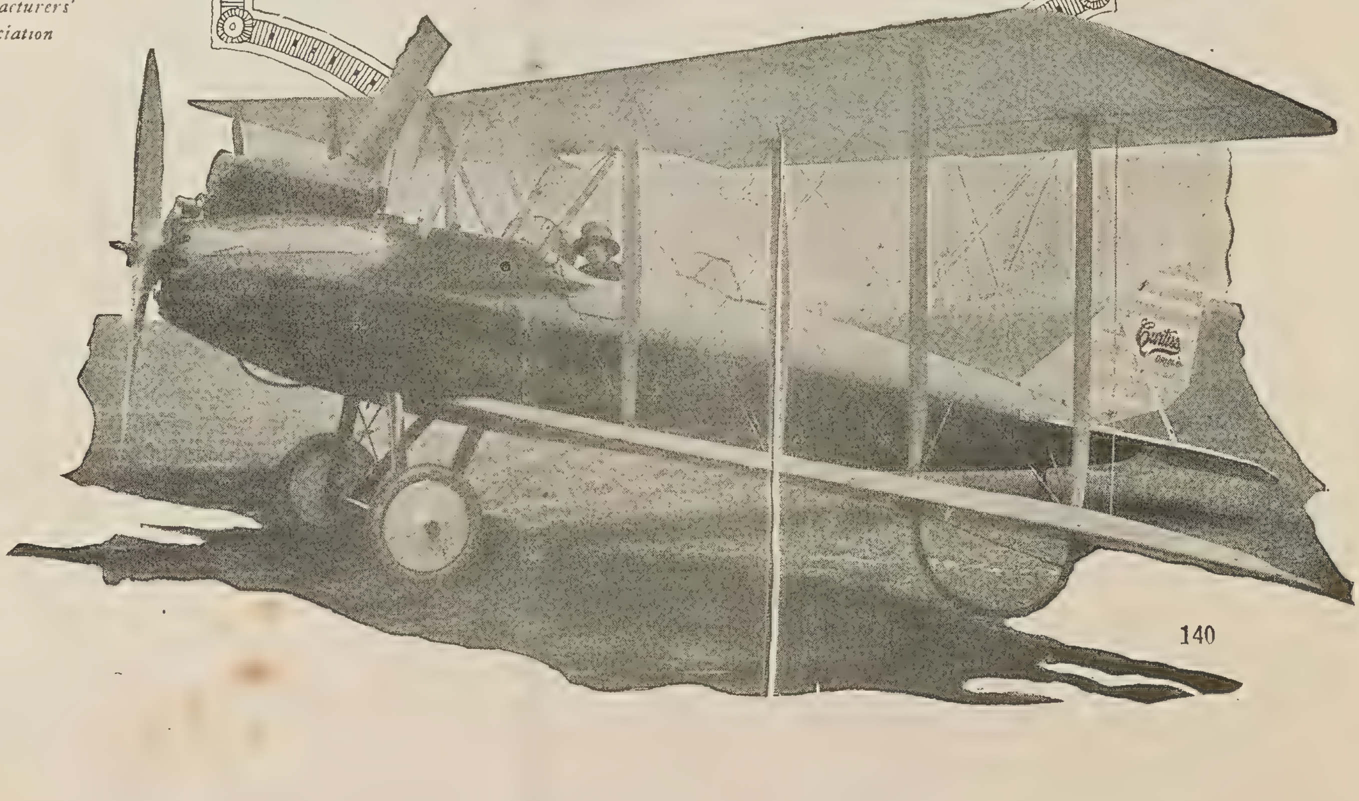

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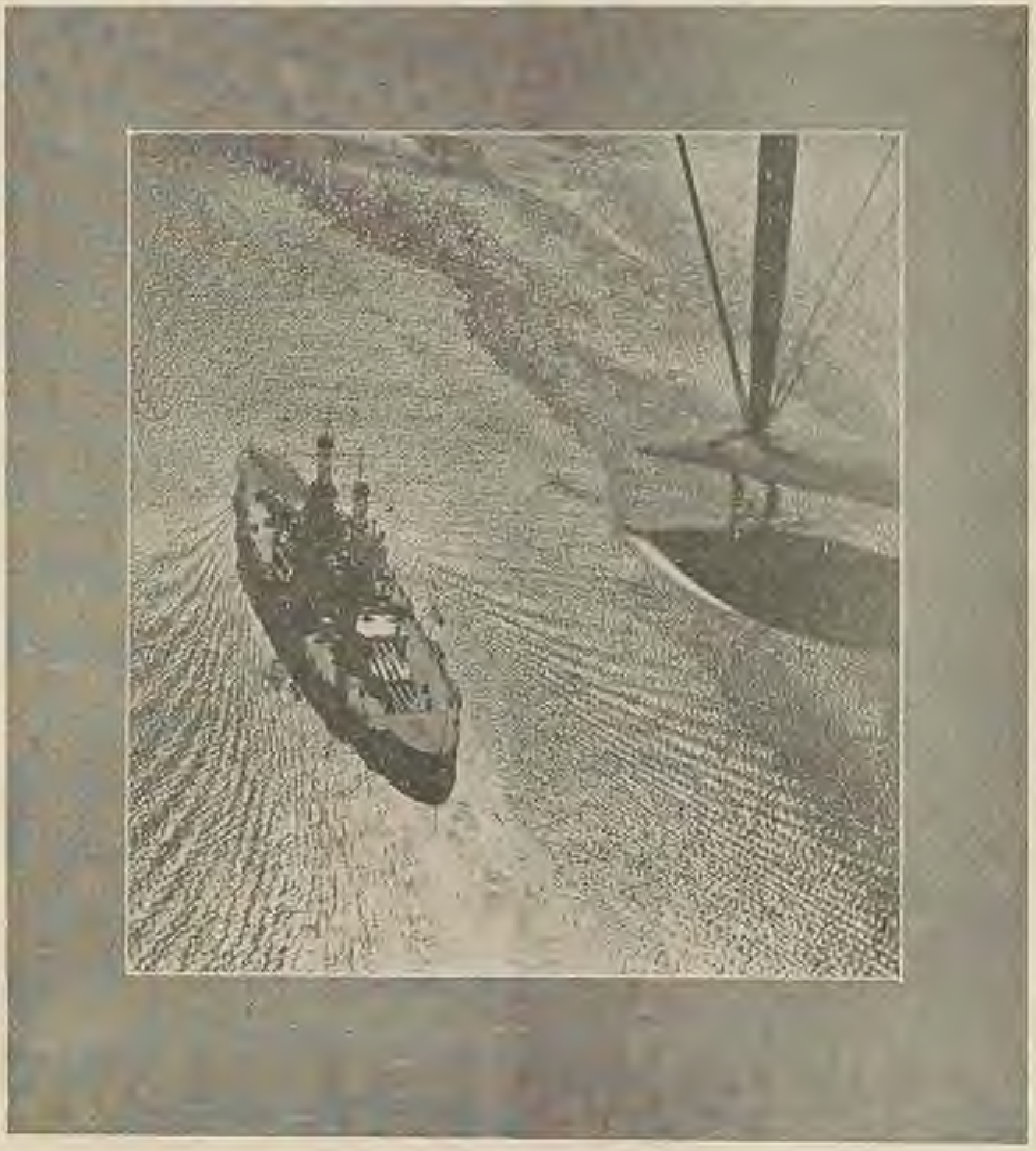

The "New Mexico" in the Golden Gate

Naval Official from Kadel & Herbert

CREW OF U. S. MARTIN "ROUND THE RIM FLYER"—Left to right: Colonel Hartz, Lieutenants L. A. Smith and E. E. Harmon, Sergeant John Harding, Jr., and Jeremiah Tobias

Martin Bomber No. 2 has been in constant use for a year at Bolling Field, Washington, D. C. With more than 10,400 miles of cross country work already to its credit, this plane was started off on an 8,000 mile flight around the rim of the United States, in command of Col. R. S. Hartz. The colonel and his crew of four have just completed their unparalleled pioneering trip.

Martin airplanes have demonstrated beyond a question the greatest ton-mile efficiency of any aircraft yet produced, and are rapidly proving that the important centres of the United States can be connected by aerial transportation with but a few hours' flying.

THE FOLLOWING IS A COMPARISON OF A FEW ACTUAL FLIGHTS BY MARTIN BOMBERS WITH THE BEST RAILROAD TIME:

FROM	TO	PILOT	DISTANCE	MARTIN AIRPLANE TIME	RAILROAD TIME
Cleveland	Dayton	Eric Springer	215 Miles	1 hour, 50 min.	6 hours
Washington	New York	Capt. Francis	225 Miles	2 hours	5 hours, 15 min.
Cleveland	Washington	Eric Springer	350 Miles	2 hours, 58 min.	14 hours, 15 min.
Cleveland	New York	Eric Springer	450 Miles	3 hours, 20 min.	14 hours
Dayton	New York	Capt. Francis	630 Miles	6 hours, 40 min.	14 hours
Macon	Washington	Capt. Francis	635 Miles	6 hours, 15 min.	18 hours

The superior performance which characterizes Martin Airplanes is the result of ten years of experience in building aircraft of a superior quality.

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CLEVELAND
Contractor to the U. S. Army, Navy and Post Office Department

I#24

Aviation's Important Part in War

Brig.-Gen. William Mitchell Gives His Reasons for an Independent Air Force

Brigadier-General William Mitchell gave a carefully prepared statement of his reasons for favoring a United Air Service before the La Guardia Aviation Committee. Extracts from it follow:

"The time has come in our development as a nation when we must look at our military policy in this country from a standpoint that we have never regarded it before. By our own entrance into the European war we injected ourselves into world politics in a more strenuous manner than has ever been the case in our history. Consequently, we can not avoid the responsibilities that come with that situation. We have proved during this war that we are entirely self-sustaining as a nation, in so far as men and materials of war are concerned. In other words, we have proved that if we have a military organization in this country which can be mobilized and concentrated and supplied, say, within a month, and one that is reasonably trained, we need fear no navy or combination of navies which would occupy the Atlantic Ocean or the Pacific Ocean, or both, providing we can deny them a place on this continent, from which they can operate. In other words, we believe that our entity as a nation can be maintained against any combination of navies by a military organization alone.

"On the other hand, a new element has come into warfare during this war, namely, the air service; and no matter to what extent we may deny hostile troops that are brought over to this country by naval vessels a landing on our coasts unless we are adequately prepared in the air we can not deny an air service access to any vital points in this country. If we give up the air to a foreign power, it has been proved during the war that they can cause incalculable damage with their air service alone by hitting our industrial and other centers of organization for war, and in all probability they could bring about a decision by their air service alone. The reason I say that is because in the beginning of the war airplanes carried missiles that weighed only a few pounds. At the end of the war they carried missiles that weighed upward of a ton each. That progress is still going on, and it has been so great since the armistice that I believe there has been as much since the war as there had been for the period of the whole war. By that I mean that aviation is developing more rapidly now than it did during any time in war.

One Great Asset

"We also believe that an adequate air service will not only greatly hamper the operations of any navy against us but will put within a comparatively short time all surface under the water; that is to say, they will be unable to resist aerial attack in any decided way. This is particularly so since the successful development of impelled torpedoes, burning bombs, aerial cannon, means of destroying searchlights on ships, smoke screens and depth bombs, radio communication has been established between airplanes and submarines, and due to impossibility of ships concealing themselves on the surface of the water from airplanes.

"With us in this country we have come out of the war with one great asset in so far as aviation is concerned, and that is we have trained a navigating personnel of about 15,000 officers during the war. By navigating personnel is meant pilots and observers. We also created a personnel of officers who had learned by experience on the front and by the handling of some of the greatest air units that the world has ever seen their business as air officers. Aside from the personnel that was developed we have developed an industry in this country for the production of airplanes, which, although it copied foreign models all the way through, which did not give our inventors in this country the initiative they might have enjoyed, still it created a means of obtaining raw material for the construction of airplanes and a method of their actual construction which was excellent. This industry has practically ceased to exist, due to the fact that no orders have been given it. We are the only one of the large nations of the world that has done that.

BRIG. GEN. WILLIAM MITCHELL

"In so far as the navigating personnel is concerned, about 925 of them have been retained in the service and the rest of the 15,000 have been allowed to disperse and go to their various homes and places of abode without any specific organization or method of keeping particular track of them or getting them back in the service in case of an emergency. Some have joined the Signal Reserve Corps. These officers are essentially air officers; that is, these navigating officers will not serve willingly in any other branch of the service, because their whole interest lies in aviation. But, on the other hand, with any sort of an organization of reserves, either active or passive, they will be perfectly willing to join any aviation body that we may see fit to organize.

Upkeep of Airdromes

"It is more expensive to create a pilot and it takes a longer time than it does to produce any other individual for military work, and no other nation has as large a number of pilots and observers as we have. If you do not have pilots, you can not fly airplanes, and therefore if we have any industry at all or anything of that sort for the production of airplanes we have got to have pilots to fly them. In time of peace we must encourage civil aviation as far as we can in order to produce equipment for use in war. Civil aviation alone can not be made to pay on any large basis at the present time. It is developing, however, constantly.

"The greatest aid, not only to military aviation but to civil aviation, will be the main-

(Continued on page 5)

Forest Patrol Operations, Season of 1919

Distance Covered 235,724 Miles, Flying Time 2,872 Hours and 570 Fires Were Discovered

On August 27, 1919, authority was given the Department Air Service Officer to direct all forest patrol operations in this department. Upon receiving this authority this office ordered the patrols out of Rockwell and March Fields consolidated,—all operations to be conducted from March Field. The patrols were extended to cover the Santa Barbara forests in addition to the forest areas North and East of March Field. This consolidation was effected and the patrols started over the new areas on September 8th, 1919. This office also ordered that DeHaviland-4 airplanes be used for patrolling instead of planes then used. The patrol routes were mapped out to cover the Santa Barbara forest. This plan, as outlined by this office, called for two patrols each day. By this change the patrols covered an additional stretch of forest area, about one hundred fifty miles in length.

The following report covers the operations of the forest patrols at March Field from date of consolidation to October 31st, 1919, the date the patrols were withdrawn, a total of one month and twenty-three days:

(a)	Total number of patrols	87
(b)	Total distance covered	22,252 miles
(c)	Toatl flying time	270 hrs. 34 min.
(d)	Total number of fires discovered	72
(e)	Total accidents requiring major repair	None
(f)	Total number of fatalities	None
(g)	Average number airplanes in daily use	2
(h)	Type of plane	DH-4

Mather Field

The first forest patrols were established out of Mather Field on June 1st, 1919. These patrols operated independently under the Commanding Officer of Mather Field until September 2, 1919, covering a period of three months. Data covering this period is given as follows:

(a)	Distance covered	31,128 miles
(b)	Flying time	452 hrs. 56 min.
(c)	Number of fires discovered	85
(d)	Number of accidents requiring major repair	1
(e)	Number of fatalities	None
(f)	Average number airplanes in daily use	2
(g)	Type of plane	JN4D

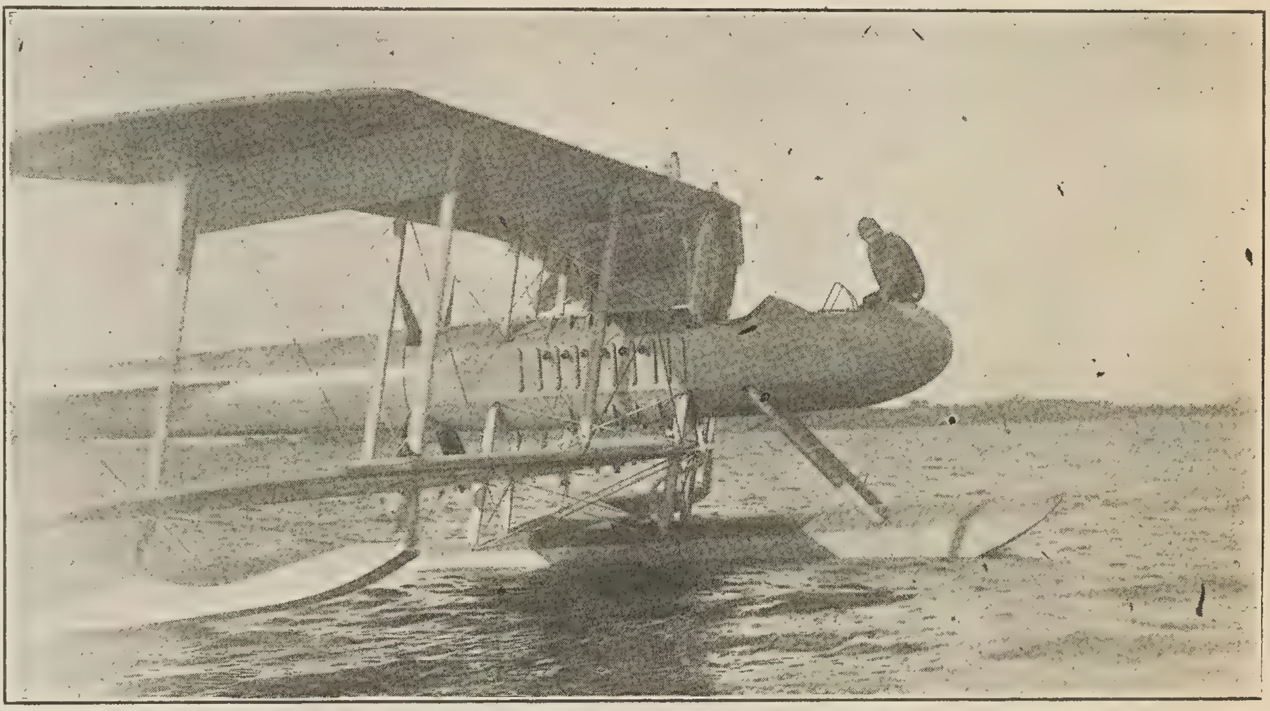
On September 3, 1919, the operations of forest patrols at Mather Field were reported through Department Air Service Officer.

For the period from September 3rd to October, 31st, 1919, the following data is given:

(a)	Total number of patrols	84
(b)	Total distance covered	16,350 miles
(c)	Total flying time	270 hrs. 34 min.
(d)	Total number of fires discovered	70
(e)	Total number of accidents requiring major repair	None
(f)	Total number of fatalities	None
(g)	Average number airplanes in daily use	2
(h)	Type of plane	JND

Oregon Forest Patrols

About July 24th, 1919, telegrams were received by this office from the Governor of Oregon and different Forestry Officials in Oregon requesting airplane assistance in locating fires which were raging in Oregon at that time. Authority was requested by this office to send planes to Oregon for forest patrol work and received in telegram from the Director of Air Service dated July 30, 1919. Lieutenant E. C. Kiel and Sergeant Frank McKee with two airplanes were at that time at Camp Lewis, Washington, on recruiting work. These two pilots were ordered by this office to fly to Salem, Oregon, and consult with the Forestry officials at that place with a view of establishing routes for patrols. They arrived at Salem on July 31st, 1919, and commenced operations on August 1st, 1919. On their first trip they took with them two forestry officials. Six fires were located. Their preliminary report to this office showed the necessity of ordering more planes to Oregon. Accordingly Major A. D. Smith was ordered by this office to Mather Field to prepare five JN4D planes and one JN4H plane for forest patrol operations in Oregon. On August 6, 1919, Major A. D. Smith, with five pilots, five mechanics and six airplanes flew to Salem, Oregon. They reached Salem on October 7th.


GALLAUDET D-4; LIEUT. E. F. STONE IN THE FRONT COCKPIT

Major A. D. Smith took charge of the patrols in Oregon on this date. He established one base at Salem and one base at Roseburg. This arrangement was continued until August 26th, when by orders from this office the seven JN4D airplanes were replaced by five DeHaviland-4 planes, and all operations consolidated at Eugene, Oregon. The operations with the JN4D planes were unsatisfactory because of the limited area which they could cover without landing for gasoline and oil. By changing to DeHaviland-4 planes greater depth was made possible into the mountains, and as a consequence more of the heavily timbered areas are placed under patrol. The cruising radius of the patrols was changed from one hundred miles to three hundred fifty miles.

The JN4D planes, upon being replaced by DeHaviland-4 airplanes were ordered by this office to Redding, California, for the purpose of establishing forest patrols out of that point. At the same time it was decided by this office to replace all JN4D planes on forest patrol work with DeHaviland-4 planes as soon as they could be assembled and made ready for this work. Accordingly Captain Lowell H. Smith was ordered to Mather Field for the purpose of taking charge of the assembling and testing of DeHaviland-4 planes for forest patrol work.

The following operations data is given on the Oregon Forest patrols to cover the period from date of its inauguration, August 1st, 1919, to October 8th, 1919, the date it was discontinued, two months and eight days:

(a)	Number of patrols	127
(b)	Distance covered	33,715 miles
(c)	Flying time	411 hrs. 24 min.
(d)	Number of fires discovered	128
(e)	Accidents requiring major repair	1 Curtiss and 1 DH-4
(f)	Number of fatalities	1—Lt. H. W. Webb
(g)	Average number airplanes in daily use	2
(h)	Type of plane	JN-4 to Aug. 26th DH-4 to Oct. 8th

The patrols were discontinued on October 8, 1919, because numerous rains and snows removed the danger of fire and at the same time made flying impracticable.

Redding and Red Bluff, California

Patrols at Redding, California, were established by this office on August 31st, 1919, with the seven JN4D airplanes which were replaced in Oregon by DeHaviland-4 planes. Lieutenant E. C. Kiel was placed in charge of this patrol. Major A. D. Smith was temporarily ordered to Redding to assist in the organization of patrols at that place. On September

(Continued on page 9)

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Telephone, Stuyvesant 4552

Aviation's Important Part in the War

(Continued from page 3)

tenance and upkeep of airdromes all over the country. We have the best flying conditions in this country of any country in the world, generally speaking. The airdromes are necessary for the development of aviation in the same way that gas stations and repair stations are necessary for automobiles on any main roads or highways. We have flown over routes from east to west and west to north to south practically all over this country, and by all the large centers of population, which, at the same time, are the strategical centers; and we have tried to induce—and have succeeded in a great many cases in having—the municipalities to reserve ground for airdromes. What we are unable to do, however, is to sell gas and oil and spare parts, etc., to commercial airplanes and to others who are forced to use these airdromes. What we now want to do is to organize all these airdromes throughout the country so that they will be available not only to our reserve aviation units but for any aviation which may want to avail itself of these facilities. That will be the greatest aid we can give at this time to aviation; and if we combine this with the organization of our reserve units that already exist, potentially, we can do it very cheaply and with very little trouble. We can also give them the obsolescent equipment which we have acquired during the war—both training and otherwise—so as to keep up their flying.

"If we organize this system of airdromes, which it will be necessary to do, and make it available to the airplanes of not only our own people but the airplanes that are coming in from foreign countries, we must have a force for properly policing the air, seeing that the airplanes that come across from foreign countries are properly inspected; that they do not bring in diseases, for instance, or contraband material; that they are safe to fly over our cities; that the navigating personnel is capable of handling them, etc. As they have to land on these fields and be revictualed there, etc., it is quite evident that the same direction should inspect them and look after them that keeps up the field. That is being done by every first-class country in the world except ours. At the present time we have no regulations whatever on the subject.

Various Departments

"Next we have the various departments of the Government interested in the use of aircraft; that is to say, the Army is interested in it, the Navy is interested in it, the Post Office is interested in it, the Coast and Geodetic Survey, the Coast Guard, Life-Saving Service, revenue officials, the Forest Service—in fact, nearly every department of the Government has some use for aircraft and personnel. If each develops along its own line the overhead will be multiplied in every case. Furthermore, training will result in a difference all the way through. Basically, all air work is essentially the same, no matter where it takes place, and basically all training is the same. There is no reason why we should have an overhead for each one of these entities instead of combining the overhead under one general direction.

"Next, from a military standpoint, it is essential to have a direction from one common source because fighting in the air is the same no matter where it may take place, whether it be over the water or over the land. The only part of aviation that essentially belongs and has to be attached to an army and a navy for their own domestic use is observation aviation, which relates to local reconnaissance for them, that is, seeing the objects that are at or near to them; the adjustment of their artillery fire, that is, telling them where their projectiles are hitting and how; and to liaison between their different elements, by liaison is meant keeping communication up between them.

"All pursuit aviation, and by pursuit aviation is meant that aviation which pursues, catches up, and attacks a hostile aviation and which, by its very nature, is the most important aviation there is because if you can shoot the enemy completely out of the air you have predominance over him—pursuit aviation is the same no matter where it is. Bombardment aviation is handled exactly under the same principles, by bombardment aviation is meant that aviation which carries heavy projectiles and throws them down in various ways. Attack aviation is that aviation which attacks objects on the ground, either troops, vessels, trains, or things of that kind.

CAPT. ROSS SMITH WHO FLEW FROM ENGLAND TO AUSTRALIA IN A VICKERS-VIMY-ROLLS MACHINE.

LEFT TO RIGHT—CAPT. ROSS-SMITH, LIEUT. V. M. SMITH, SERGT. J. M. BENNETT.

Photo International

Aviation's Principal Mission

"The principal mission, therefore, of aviation, is not observation for units to which it is attached, but is the destruction of hostile aviation, in the same way that the principal mission of the navy is the destruction of the hostile navy, or the principal mission of an army is the destruction of the hostile army. Therefore, in order to unite and bring your greatest effect to bear in any one place it is necessary to unite all the elements of your aviation at the place where the decision is to be called for, no matter whether it is war on the sea or land. In this particular case we had a war on land, essentially in Europe. No nation ever held the sea to the same extent that the Entente Powers or the Allies held the ocean during the emergency. It was necessary, therefore, to concentrate all the aviation against the enemy on land, and that is where the fighting in the air took place. There was no fighting on the sea to amount to anything. The use of aviation on the sea related almost entirely to observation and reconnaissance.

"Now, those are the main considerations which impel us to recommend that the United States unify its air services under a central direction, which will give the greatest economy in administration and upkeep and at the same time will put the direction of air service matters under air officers who are expert in its use and handling, and who are essentially interested in its development, as distinguished from putting it under the older services, who regard it as an auxiliary and who are not specifically charged with its development as an arm by itself. All other great nations have come to this solution—that is to say, of uniting their air services.

"Under the Department of Aviation you have an air force which has one branch with the Army and one branch with the Navy, which would handle under the Army and the Navy the observation aviation which they need for their domestic and local use, but that the personnel assigned shall be air-force personel; they would act very much in the same way that the marines did when they were assigned to duty with the Army.

How the Plan Would Work

"You would have an air force for the military service, one for the Navy, and a central flying force for offensive duty, which could be used anywhere—that is, pursuit, attack, and bombardment aviation. I would recommend a director of civil aviation under the department, who would be charged with drawing up and looking after all laws regulating the use of civil aviation, the upkeep of aerodromes, and their proper policing, etc., of the assignment of personnel and material to any of the civil departments of Government that required its use, such as the Post Office Department, the Treasury Department in its various activities, and other departments of Government. His work would be to see that suitable personnel and material was supplied to them and that it was kept up.

"In the case of the Post Office Department they would have complete, we might say, tactical jurisdiction over it. They would establish the schedules and do anything they desired to do, but they would not be charged with maintaining a technical section for the development of equipment, or with a purchasing department for getting it, or anything of that kind. Furthermore, this would give general supervision of all this equipment so it could be transferred or transformed to war use whenever necessary, very much in the same way that ships are designed for that purpose now. As another branch, I would have a supply branch which would be charged with the finances, with the technical work and with the production of this material. Those are the three big branches, the civil branch, the supply branch, and a skilled air force, under a central officer who would be a civil officer of the Government.

Present Equipment Obsolete

"Since the declaration of the armistice we have constructed no new equipment in this country. The equipment which was constructed before the armistice is now of an obsolescent, if not entirely obsolete type. All the equipment that we constructed for war purposes before the armistice was of a foreign model. That was necessary because we had not, at that time, developed any types which had been proven in the war. The other nations of the world kept right on with their progressive development of aviation equipment, so that at this time they have in their hands, or they are capable of getting within a very short time, equipment which is entirely up to date. By this I mean that at the time of the armistice we were using in pursuit ships engines of 220 horsepower. Pursuit ships of today are equipped with engines of 340 horsepower. The same proportion

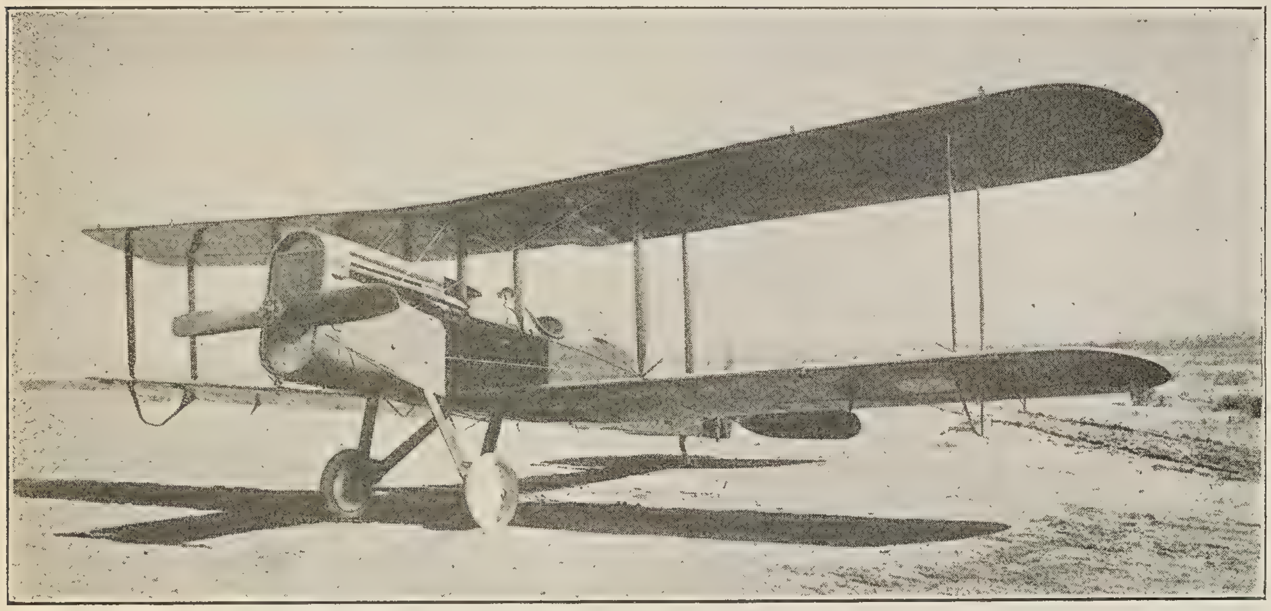
(Continued on page 7)

Notes on Technical Aeronautics

DH-4 REMODELLING SPECIFICATIONS

The type DH-4B airplane is being remodeled for the Air Service according to specifications from existing DH-4 airplanes. The materials used in this remodeling will conform to Air Service specifications wherever applicable.

The major requirements of the modifications are as follows:—



THREE QUARTER FRONT VIEW OF THE DH-4B (BLUEBIRD)

(a) The gasoline tank shall be moved forward and located approximately at Station H.

(b) The space formerly occupied by the gasoline tank shall be utilized for the pilot's cockpit.

(c) Controls shall be revamped, including a new stick control in the gunner's cockpit.

The alterations and additions made necessary by these requirements are in general as follows:—

(a) Rearrangement of truss and brace wires at center section.

(b) New fuselage reinforcement at tank.

(c) New fuselage reinforcement at Station II.

(d) New bulkheads between Station 8 and 9 and between Stations 10-A and 1 and a new cross number at Station 8.

(e) Re-location of pilot's floor.

(f) New cowling over tank and pilot's cockpit.

(g) Relocation of fixed guns.

(h) Re-location of engine controls in pilot's cockpit.

(i) Relocation of engine controls in pilot's cockpit

(j) Re-location of storage battery, oxygen apparatus, radio equipment, fire extinguisher and miscellaneous equipment, formerly in the pilot's cockpit.

Allowance has been made in the seating design to permit each occupant of the machine to wear a parachute strapped on the back.

The following airplane companies have been awarded contracts for the performance of this work:—

Aeromarine Plane and Motor Co.	47
Gallaudet Aircraft Corp. E. Greenwich, R. I.	47
L. W. F. Engineering Co. College Point, L.I.	47
Thomas-Morse Aircraft Corp. Ithaca, N. Y.	47
Boeing Airplane Co. Seattle, Wash.	47
Curtiss Airplane and Motor Corp. 52 Vanderbilt Ave., N. Y.	47
Dayton Wright Airplane Co. Dayton, O.	48

METERING CHARACTERISTICS OF CARBURETORS

Synopsis of Technical Report No. 49 prepared by P. S. Tice and Dr. H. C. Dickinson of the Bureau of Standards and covering scientific research conducted for the National Advisory Committee for Aeronautics, Washington, D. C. This report is divided into six parts as follows:

Part I.—Description of Carburetor Test Plant; describes the carburetor testing equipment constructed by the Bureau of Standards for the convenient and accurate observation of carburetor performance alone, unaffected by engine characteristics. This apparatus permits the testing of carburetors and their elements at widely varying air pressures and temperatures, for both steady and controlled pulsating flow. Fuel quantities are determined by weight and air quantities by an included orifice meter.

Part II—Discharge Characteristics of Fuel Metering Nozzles in Carburetors; describes the results of experiments to determine the effects of varying the diameter, length and form of entrance of metering passages, as well as of fluidity change with temperature. It is concluded that control of mixture ratios is obtainable by simple selection of the ratio of diameter to length for the fuel metering passage, if other conditions remain constant.

Part III.—Characteristics of Air Flow in Carburetors; discusses the results of experimental determinations of the coefficient of discharge for various types of carburetor air metering passages. The most important conclusions are: that the discharge coefficient increases with the thrust velocity up to about 145 feet per second and thereafter remains almost constant; that considerable variations in passage form, air density, and amount of fuel admitted to the air stream do not materially alter the discharge coefficient

Part IV.—Effect of Pulsating Air Flow in Carburetors; gives the results of experimental determinations of the effect of pulsating air flow upon the metering characteristics of two carburetors embodying widely different metering methods. It is concluded that carburetor capacity is negligibly affected by pulsations of the usual rates and amplitudes, but that the metering is affected sufficiently to necessitate the consideration of pulsation characteristics if mixture ratios are to be accurately controlled.

Part V.—Natural and Required Metering Characteristics of Carburetors; is a discussion of the theoretical and experimental mixture proportioning characteristics of carburetors as applied to aircraft service, also of the mixture ratios for optimum engine performance. The altitude and throttle compensation characteristics experimentally determined for five carburetors are studied and a new type is shown which possesses nearly complete altimetric compensation. From the standpoint of engine requirements, it is concluded that the mixture ratio which produces maximum power is practically constant at 15 to 1 for gasoline at all air densities, but that the mixture ratio for maximum economy decreases with the air density. With respect to natural carburetor performance, it is concluded that the ordinary variations in structure and fuel control inappreciably affect the altimetric compensation but do very materially affect the throttle compensation.

Part VI.—Control of Carburetor Metering Characteristics for Aircraft Service; discusses means for securing correct altimetric and throttle compensation. It is concluded: that several methods will be equally effective; that automatic regulation is more desirable than manual; and that an automatic control can be made to provide complete compensation.

Temperatures in Spark Plugs Having Steel and Brass Shells

Brass has often been assumed superior to steel for spark plug shells because of its greater heat conductivity. The measurements described in this report prove the contrary, showing that the interior of a spark plug having a brass shell is from 50 to 150 C. (90 to 270 F.) hotter than that of a similar steel plug. Consistent results were obtained in both an aviation and a truck engine, and under conditions which eliminated all other sources of difference between the plugs. It is to be concluded that steel is to be preferred to brass for spark plug shells. (National Advisory Committee's Report.)

Aviation's Important Part In War

(Continued from page 5)

obtain with ships for observation or for bombardment or for attack, so that at this time you might say, strictly speaking, we have no war equipment with which to conduct a war against a first-class power. We have models of such equipment on hand which are equal or superior to any others in the world. They have on hand at our engineering section at Dayton and we have inspected them personally and they are splendid. It will take us from a year to a year and a half or two years to produce them in sufficient quantity to put them in the hands of our troops in case of trouble.

* * *

"I believe a man can fly up to the time he is 60 years of age. During the war the French had a man flying at 57 years of age on the front. We have one 48 years old who flies pursuit ships. I believe that when a man first comes into the service he should be a young man, much less than 30. Our best pilots in Europe were from 25 to 30 years of age. It makes a difference with the pilots that are engaged on the line; these should be young. In so far as the direction of air units is concerned and the handling of the service, that requires the knowledge of men who have had long experience.

Civil Industry Must Be Fostered

"If you do not foster the civil industry you would have to depend on foreigners, because you never could keep up a Government plant sufficient for the production of a great number of planes necessary in case of emergency. You have to be dependent upon private interests in the end for anything the Government needs in great quantity.

"I am in favor of the establishment of fields throughout the country at which pilots could get their fuel and spare parts for their planes at cost. I would also make available all the engineering data which the Government has, supplying it to the factories so that they could use it and get any data they wanted for specific work. I think you could outfit the Government with sufficient airplanes for all uses for next year—the Army, the Navy, the Post Office Department, and all other activities of the Government—for about $80,000,000; and after that I think an annual appropriation for the construction of airplanes of $50,000.000 would cover it very well.

"We have an example of the Government ownership of airplane factories in the case of another country. The result was that the whole thing was controlled by a very few individuals and they did not utilize the inventive ability of that particular country.

"We need to get away from the conventional, old types of airplanes that we have been using during the war, to which we have been confined, and to make new types, and we want to get the greatest number of minds possible working on that proposition. Things along this line have been coming so fast since the war closed that it is almost impossible to keep up with them. I mentioned the Turbo Booster as an instance. It carries the airplanes into altitudes which we never thought of before. If we confine our air activities to one of the older departments, they will be regarded as simply auxiliary and not as the main proposition.

"If the Air Service is to be regarded as a major arm and developed, then combine its activities and fix the responsibility on one department for its efficiency; if it is to be considered as nothing but an auxiliary, then do not have any Air Service, which will be an annuncement to the world that we will abandon the air to others' dominance, commercially and in a military way."

BRITISH A. F. INDEPENDENCE

The constitution of the British air force emphasizes its integrity and independence as a separate fighting unit of the Crown, says the Manchester *Guardian*. This is indicated by the special ranks created for the force. The three higher ranks—marshal of the air, air chief marshal and air marshal—may not be filled for some time. It is expected that the highest rank at present will be vice marshal, which will go, of course, to Sir H. M. Trenchard. It is equivalent to rear admiral or major general.

It is important to remember that, while the other arms of the Crown are returning to a pre-war basis, the air force had no pre-war basis, and so has to construct itself anew on a peace footing.

An officers' cadet college is being established, and will begin its first course next January. Its organization has been carefully drawn up after consultation with educational authorities. Lord Hugh Cecil was the chairman of the committee, which gave long consideration to the matter. For the first years cadets will be admitted by ordinary competitive examination, as for the army, but possibly another and better way may be found for this exceptional work. There will be special courses in navigation by day and night, photography, bombing, gunnery and wireless, in addition to special technical engineering schools. A proportion of the cadets will go to the Air Staff College.

Throughout the training there will be the closest cooperation with the navy and the army, all leading up to, if not a joint staff, a joint pool of common knowledge, so that the three services can cooperate in the closest union in war. All officers of the air force must learn to fly, with the possible exception of the doctors and chaplains. The air force have already demobilized 1,917 officers and 211,000 other ranks. It is a question if the demobilization has not been too quick, throwing too great a strain on the cadets to build up the new force.

Men and boys will be enlisted and receive training in engineering and all its branches applicable to the air. One inducement pointed out by the air authorities is that their service has the advantage that, whatever the length of service of the man, he receives training fitting him for civil life. It is the reverse of a blind alley occupation. They hope to enlist considerable numbers of men already skilled in the work.

The importance of good workmanship is emphasized, for life in the air depends on good mechanics and good riggers. The air authorities hope in the next three months to organize the new force, and they will take as their scale the pre-war army and navy.

The foreign service part will appeal to many men. There are squadrons and parts of squadrons on the frontiers of Afghanistan, Egypt, Palestine, the Caucasus, Archangel and Mesopotamia and in France and Germany, and in most parts of the empire. The men on foreign service will not have to spend their whole period (a minimum of four years) abroad unless they want to do so. Short periods of foreign service are aimed at.

The force will begin with the pride of achievement in a record of the air that is the envy of the world.

A scheme is being worked out by which the Air Force can be identified with the Territorial Force, forming in some respects part of it. The Territorial air organization will probably begin in certain counties where there are aerodromes.

FLYING AND PHOTOGRAPHY

Flying not only furnishes a new viewpoint, but also a new vantage point for recording with the camera information that is valuable for other purposes than mapping. An enterprising lumberman with extensive timber lands could explore his forests from the air and record his observations by means of aerial photography. From the photographs an accurate estimate of the amount and location of each species of timber available on his land could be made and these photographs would make possible the filling of the needs of the market in the shortest space of time.

Another field of utility would be the photographing of real estate for advertising purposes. An aerial photograph not only permits of the comprehensive presentation of large tracts of land, but it can be used as an attractive advertisement. Chambers of commence will turn to photography from the air for securing photographs of their cities, to show railroad lines, harbor facilities, well-arranged streets for hauling manufactured products, residential sections for workmen's homes, factory districts, groups of large business buildings and for other purposes.

Photographs of the same city, taken at intervals of a few months or years, would illustrate more eloquently than an array of charts the statistics as to its growth. Fire insurance companies will inevitably become interested in these aerial surveys as they would in fact be inspections from the air that would give the companies a bird's-eye view of the conditions and surroundings of buildings in various sections of the city and thus enable them to realize and keep check on the fire risk involved.

The foregoing compose most of the more important applications of aerial photography. While these workaday problems are under consideration, sight should not be lost of the possibilities of aerial photography in the realm of sport. Although this possible application has not as yet received the same amount of attention, it is already realized that motion pictures made from the air, of races for instance, would show the gains and losses of the contestants in a better way than they can be seen by a spectator limited to one viewpoint.

NORMA COMPANY OF AMERICA

On December 10 the Norma Company of America, manufacturers of "Norma" Precision Bearings, moved its factory from the Bronx, New York City, to Anable Ave., Long Island City, N. Y., where a modern four-story reinforced concrete building has been acquired.

Under the new arrangement a largely increased factory space is secured, making possible added output of "Norma" bearings necessitated by the growing demand for these high-precision units.

The new plant is being rapidly equipped with the special machines needed for precision manufacture, and the full capacity will be available shortly.

The executive offices at 1790 Broadway have been consolidated with the factory at the new address.

SPOKANE LANDING FIELDS

Spokane, Wash., is to have two landing fields. The Symons-Russell Aviation Company, which has been utilizing the Parkwater field since its organization, has now secured ground of its own under lease from two transcontinental railroads and located four miles from the center of the city. The new field is 2500 feet long and 900 feet wide, free from houses, trees or wires on three sides, perfectly smooth and adjacent to various emergency ladning places.

A contract has been made for a hangar and it is proposed to follow this with repair shops and gas tanks. It is claimed this field complies almost completely with federal requirements.

EX-ARMY FLIERS JOIN

Bernard Bros. and Paul Francis, ex-army aviators, have joined forces in Spokane, Wash., and have two airplanes flying there. The merger is said to contemplate opening up a new aviation field with hangars and modern equipment.

SCHROEDER TO TRY AGAIN.

Major R. W. Schroeder is expected soon to make a new airplane flight, using a Lapere machine with a supercharged Liberty engine.

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A Happy New Year

IN the year about to dawn AIRCRAFT JOURNAL believes aviation in the United States will move forward speedily and toward even greater prosperity—and to all of its friends this magazine extends the compliments of the season.

The Large Airplane and its Limitations

IN a recent paper before the Aeronautical Society of Great Britain, A. Ryan gives a hopeful view of the possibility of building large airplanes.

The arguments in favor of the view that there are limits to the size of efficient airplanes are very briefly stated:

The weight of structures similarly loaded and of equivalent strengths vary as the cube of the linear dimensions.

The gross lift of an airplane varies as the square of the linear dimensions of the planes.

So that if all other items, such as resistance, vary as the weight, or the square of the dimensions, and the weight of the structure increases at a more rapid rate than the lift or area of the planes, then at some point there will be no margin for useful load.

But starting with an airplane of four tons for which weights and resistances are detailed, Mr. Ryan demonstrates fairly conlusively that with increasing size, the proportional effect of resistance is very much decreased.

The power plant weight may go down, as in larger engines, weight per horse-power may go down, and tanks weigh less for a given capacity.

Refinement of structure is also possible in the large machine.

The conclusions are that at 85 tons there might still be a useful lift of 32 per cent.

The paper is certainly hopeful and reasonably so.

A Universal Test Engine

THE Power Plant Section at McCook Field has developed a single cylinder test engine, which marks a real development in engine testing. By an extremely ingenious design of crankcase, adjustable crankshaft and connecting rods of varying lengths, it is possible to test in this device, cylinders having bore diameter from four to eight inches, and strokes from four inches to ten inches inclusive. Compression rates can be varied from 4 to 1, to 10 to 1. This covers the range of most of the airplane engines in use at the present day.

The universal test engine allows the value of any cylinder design to be ascertained before a complete engine is constructed, with much saving of expense in all experimental engine work.

Aerial Navigation Devices

IT is interesting to note the increasing attention being given to aerial navigation. While the principles of aerial navigation are not dissimilar from those of marine navigation, aerial work is conducted under much greater difficulties, partly owing to the greater rapidity of action and the lessened time available for the taking of observations and the making of computations, and partly to the restricted space available for aerial navigation in the airplane of average dimensions.

Necessity being the mother of inventions, it is thanks to these very difficulties that ingenious devices have come to the forefront.

Among these, two are worth special mention. One is a special method of map mounting, in which a long strip of map covering, say 100 or more miles of country in the north—south direction is taken and cut into a number of narrow strips in the east-west direction. These are mounted on linen and folded after the manner of accordion pleating. The map is held in a flat holder, which can be carried by the navigator in a convenient position. The pilot or navigator can unfold strips at need in the restricted space of an ordinary cockpit.

In the other device a simple protractor arrangement, together with a compass, allows for an immediate setting of the course which is correct for a given plane and wind velocity, by very simple operations.

While these devices may be simple, even obvious, they will aid the commercial pilot greatly in his everyday work.

Folding Wings and Dropping Wings

A RECENT Navy specification asks for folding wings, and for an arrangement permitting the wings to be readily dropped when the seaplane is afloat and incapacitated for flight.

While the introduction of folding wings seems an easy matter, in reality it involves quite a number of structural difficulties for a seaplane. Thus while the upper wing on folding back may clear the tail surfaces comfortably, the lower wing seems perversely to entangle itself in the stabilizer. Hence the overhang which is almost invariably present in a seaplane with folding wings. The overhang though perfectly sound, detracts from simplicity of design, since the upper and lower wing can no longer be exactly alike. At the hinge points, considerable care is required, so that while the folding back of the wings is possible without any slackening of wires, there is not too great a distance between the point of attachment of a lift wire and of a strut, with correspondingly large offset moments.

The design must also be such, that it is possible to dispense with the carrying of a turnbuckle strut. Altogether the problem, apart from the question of the hinges themselves, is as intricate a one as the designer can wish.

When it comes to dropping the wings, the best solution seems to be that of dropping the hinges on the fixed portions of the wing spars. If this is to be done, considerable care is required so that strength may not be lost thereby.

The Navy is perfectly justified in setting these problems, and their solution by designers, will mark a step forward, with subsequent application to commercial seaplanes.

A Suggestion for Light Steam Boilers

WHILE considering the possibility of utilizing a steam engine in the airplane, the well known French investigator A. Toussaint suggests that just as the turbo-compressor has been used to supply an increased amount of oxygen to the internal combustion engine, so a compressor device might be used to assist and lighten the steam engine boiler. Since the desirability of a steam-power plant is counterbalanced by its excessive weight, every means of securing lightness is valuable and M. Toussaint's idea seems important and interesting.

Forest Patrol Operations, Season of 1919

(Continued from page 4)

6th by orders from this office the seven JN4D planes were replaced with five DeHaviland-4 planes and patrols continued with DeHaviland-4 planes until October 31st. Lieutenant J. S. Krull relieved Lieutenant E. C. Kiel as Commanding Officer on the same date. On September 15th the patrol base was changed from Redding to Red Bluff. This change was made after an inspection by the Department Air Service Officer because better facilities for a base existed at Red Bluff than at Redding. A complete report of the operations of this patrol from the date of its inauguration to the date of its discontinuance follows:

(a)	Number of patrols	93
(b)	Distance covered	29,239 miles
(c)	Flying time	340 hrs. 39 min.
(d)	Number of fires discovered	107
(e)	Accidents requiring major repair	2
(f)	Number of fatalities	None
(g)	Average number of airplanes in daily use	2
(h)	Type of plane	JN4D to Sept. 6 DH-4 to Oct. 31

Fresno, California

Forest patrol at Fresno was established by this office on August 28, 1919. Two airplanes, two pilots and two mechanics were the personnel and equipment at first. JN4D airplanes were used. Lieutenant Robert Kauch was the senior pilot. On September 14th this detachment was increased to four JN4D airplanes, four pilots and six mechanics. Three DeHaviland-4 planes replaced the JN4D planes on September 21st, 1919. This patrol was discontinued on October 31st. Following operations data covering period of operations is given:

(a)	Number of patrols	85
(b)	Distance covered	19,709 miles
(c)	Flying time	254 hrs. 26 min.
(d)	Number of fires discovered	9
(e)	Accidents requiring major repair	0
(f)	Number of fatalities	0
(g)	Average number of planes in daily use	2
(h)	Type of plane	JN4D to Sept. 21 DH-4 to Oct. 31

Summing up the forest patrol operations this season it is desired particularly to commend the pilots and mechanics on their excellent work. Practically all of the forest areas are over mountainous terrain. The number of available landing places in case of motor trouble are very few. Skillful piloting is necessary to avoid being lost in the smoke and fog which prevails when large fires are burning. The pilots and mechanics have performed this work with a willing spirit and it is by their efforts principally that the successful results obtained during the season were made possible. The mechanics, as a rule, acted as observers for their pilots. On account of this fact orders were issued placing all mechanics who made such flights on flying status.

That the airplane patrol has aided materially in checking the number and extent of forest fires is an unquestioned fact. Forestry officials have expressed themselves as being very much pleased with the results obtained this year.

SUMMARY OF FOREST PATROL OPERATIONS, SEASOON 1919

	Rock. 6-1–9-7	March 6-1–9-7	March 9-7–10-31	Mather 6-1–9-2	Mather 9-2–10-31	Red Bluff 8-31–10-31	Fresno 8-28–10-31	Oregon 8-1–10-8	Total
Distance Covered	36,854	46,297	22,252	31,128	16,530	29,239	19,709	33,715	235,724 miles
Flying Time	410 hrs.	466 hrs. 56 min.	265 hrs. 34 min.	452 hrs. 56 min.	270 hrs. 34 min.	340 hrs. 39 min.	254 hrs. 26 min.	411 hrs. 24 min.	2,872 hrs. 49 min.
Fires Discovered	24	75	72	85	70	107	9	128	570
Accidents Involving Major Repairs	0	3	0	1	0	2	0	2	8
Fatalities	0	0	0	0	0	0	0	1	1
Airplanes used Daily	2	3	2	2	2	2	2	2	17

A SUCCESSFUL HELICOPTER

According to the Paris correspondent of the Daily Mail, a claim is made that an airplane has been invented which will solve the difficulties of vertical ascension, staying still in the air, and slow flight. The designers are Professor Louis Lacoin, of the Central School of Arts and Manufacture, and M. Louis Danblanc, an engineer. The The plans and models which have been submitted to the French government, have been found so promising that the State has not only bought all patent rights but has also advanced £4,000 for further experiments. The inventors have spent £10,000 on it already.

The first machine, begun in 1915, is now approaching completion. It has no wings or planes with the exception of two small rudder fins at the tail. Its suspension in the air and its propulsion are effected by means of twin four-bladed propellers. The blades of the propellers are built of material similar to the wings of an ordinary machine, though much stronger. Each blade is capable of a change of angle, and it is by this means that the angle, elevation and speed of flight are regulated. By adjusting the propeller blades and the speed of the twin motors it is stated that almost complete immobility in the air can be obtained.

In an interview in the DAILY MAIL M. Lacion said:—'The airplane or alerion, as we call it, is in reality a simple machine. The body is built exactly like that of an airplane with rear skid, landing wheels, and rudder. The chief novelty is that the entire force of suspension is provided by the twin propellers, which are situated in a horizontal position on either side of the body of the machine in the axis of the center of gravity. The propellers are four-bladed and resemble roughly a lucky clover with four leaves. Each blade is like the wings of an ordinary aeroplane with longitudinal strut and metal membranes covered with aeroplane linen.

"So I have calculated that our motors need never drive these propellers at any very high speed (roughly one-third the speed of the ordinary flying machine propeller.) Yet to insure rigidity they are further consolidated by steel stays which make them capable of overcoming a strain of more than 8000 lb.

"Our machine does not need to start at any great speed, and, indeed, when we put the full-size machine to its full test next spring I intend to start at the lowest speed possible. It is only when with the 'joy-stick' I put the blades at the proper angle that gradually the machine will rise horizontally. When I want to move forward I manoeuvre the tail and push the joy-stick over a little farther.

"If one of the motors stopped, the apparatus linking them up, so that they both work the propellers at the same speed, would ensure a slow flight with the remaining motor. If both failed at once, the pilot would put them out of gear and the machine would plane down supported by the 360 square feet propeller surface and the propellers would revolve independently by wind pressure." (Aeronautics)

UNDERGROUND AIRSHIP SHED

In a recent issue of Der Motorwagen, the writer describes a design of underground airship shed which was apparently placed before the German authorities, and which as up to now has been subject to censorship.

A pit forming a closed circle, and gradually narrowing downward, forms the underground hangar, the diameter, breadth across the wing, and height of which are chosen so as to leave sufficient clearance for the airship. From the plan it appears that an annular trench 40 m. across the annular portion, and of 185 m. mean diameter should be able to house eight airships, or, say four of the rigid type 145 m. long, and four others of the non-rigid type from 90 to 100 m. long. The diameter of the annular trench could be reduced if it were desired to accommodate fewer airships.

In this system, the annular portion of the roof, as well as the doors of the shed, can be made to slide about the center of the circle so that if more than one of each type of airship is contained in the shed, it would be possible to send out the one whose longitudinal axis was not likely to be deflected by the direction of the prevailing wind. Again, it is suggested that the floor or platform should be capable of revolving also, which would further simplify matters.

Dealing with the cost of this design of shed, the writer estimates that less land would be required for the site, as it would be possible to use the roof of the underground hangar as a landing place. Charges for excavation and removal of earth would not be inordinate, as the material excavated need not be carried away, but could be used for banking up the ground inside and outside the annular pit. A thick masonry lining for the pit would be unnecessary, as the danger of collapse of the sides would be obviated by decreasing the diameter of the pit from the top downwards, since only room for the car is necessary on the floor. A thin layer of concrete should thus be sufficient as lining. The site should, of course, be chosen so as to be free from ground water.

The roof of the shed would be of light iron construction with corrugated iron or similar framing, and small top lights. The space of roof to be covered in is comparatively small, as compared with the circular type of hangar. The sliding roof of the shed would be supported on wide diameter rollers running on a well machined roller path, driven from a motor placed diametrically opposite the shed opening and operating through teeth cut in the runway. The double sliding doors would also be driven from the same motor, by suitable means.

The shipping in and out of the airships could be carried on wtihout difficulty. For the latter operation, it would be sufficient to post a squad of men at each side of the sliding doors in the roof. The men would gradually release the guy ropes and the airship would ascend by its own bouyancy.

HAWKER MAY FLY TO ASIA

Harry C. Hawker, intrepid pilot, who was unsuccessful in his attempt to bridge the Atlantic in a single flight, will be the pilot of a 660 horse-power White monoplane when it leaves on its flight for the Asiatic continent.

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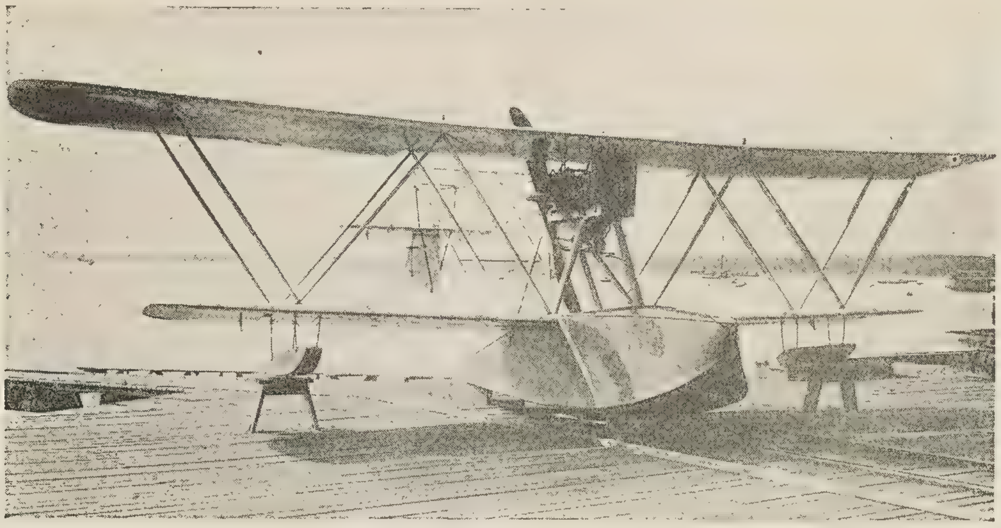

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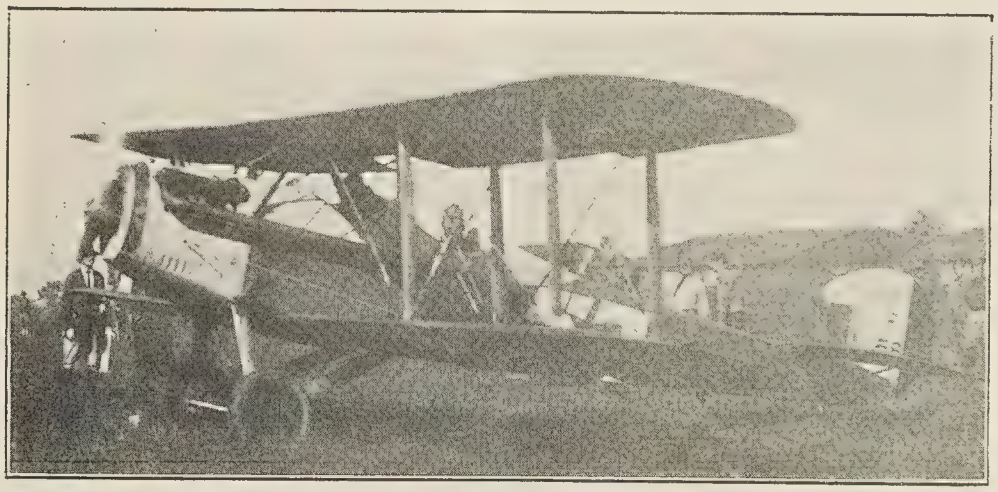

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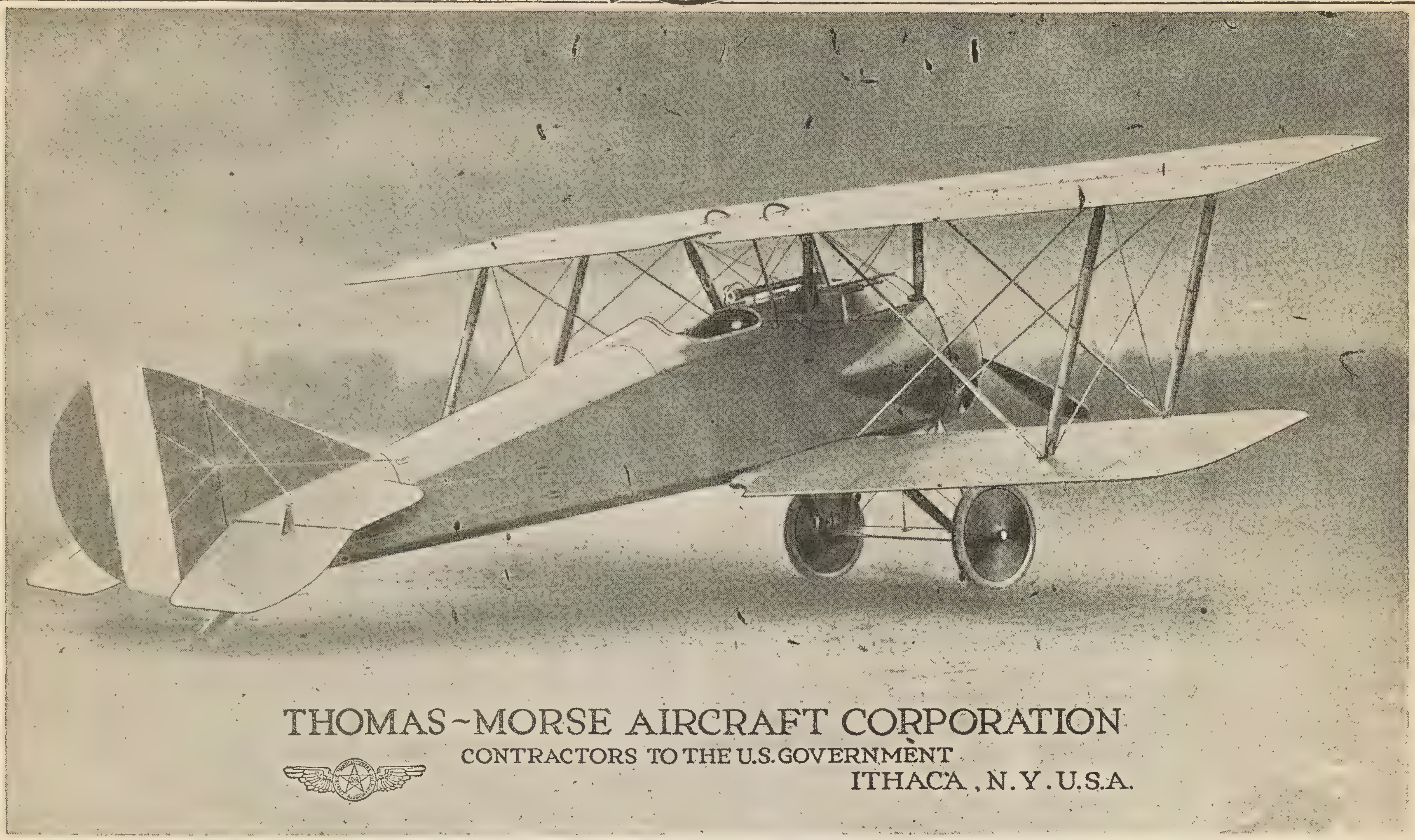

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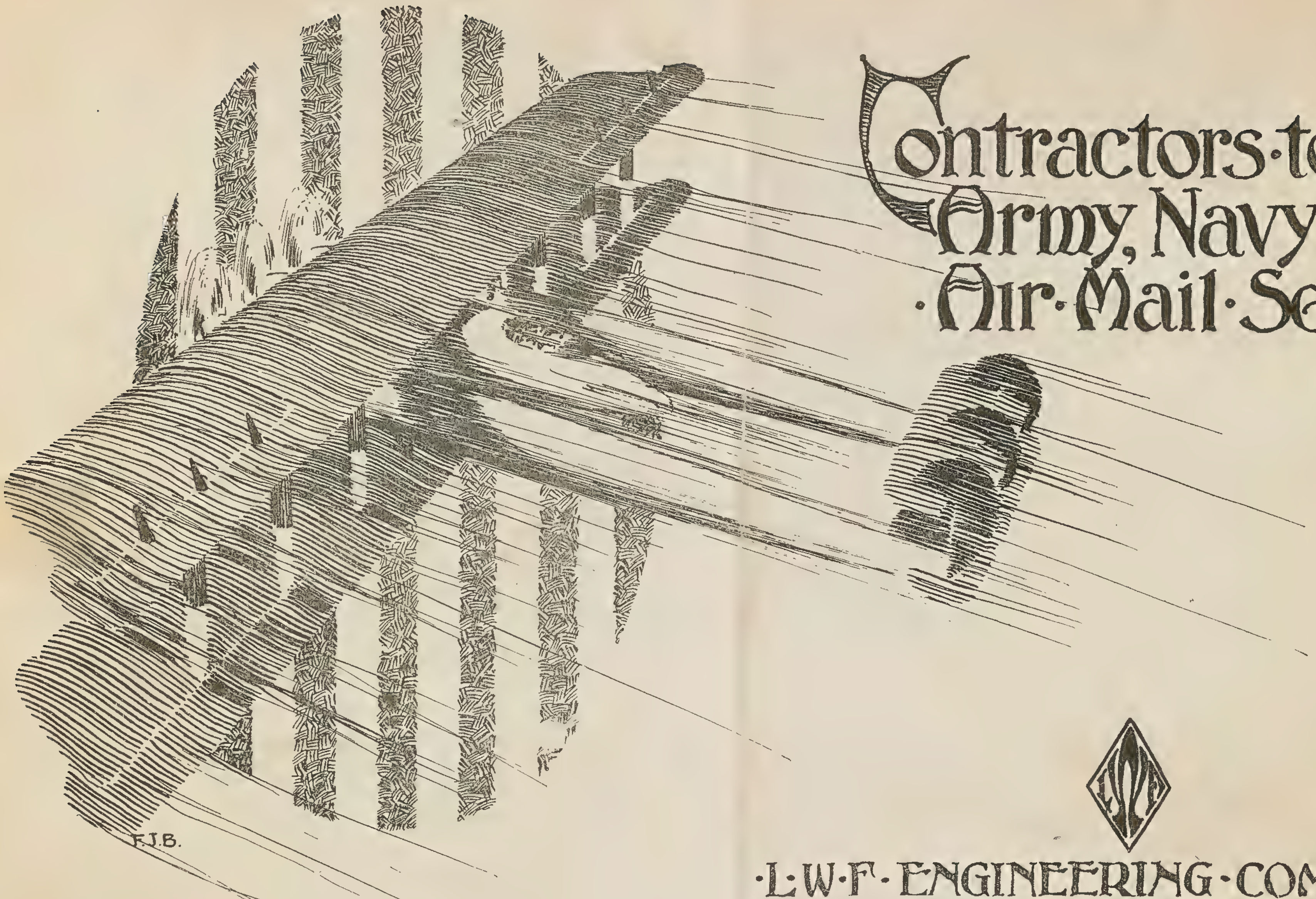

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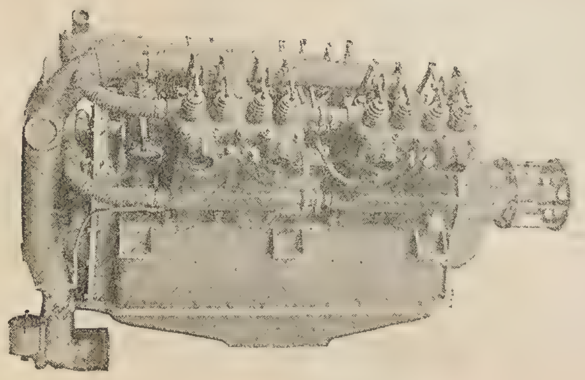

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